# COLLABORATIVE ACTIVITIES 2016-2017

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ECE - 314175712054

Certificate No: 0780/B-6/2017

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RAJIV GANDHI MEMORIAL TELECOM TRAINING CENTRE

GST Road, Meenambakkam, Chennai - 600 016.

# CERTIFICATE

*This is to certify that*

*Mr/Ms* G VEERA VENKATA SRUJAN , IV YEAR B.E(ECE)

*studying* in SRKR ENGINEERING COLLEGE, BHIMAVARAM,ANDHRAPRADESH

*has undergone training in* Internship on Telecom

*held at RGM TTC from* 12/06/2017 *to* 16/06/2017

*for* One *week(s).*

Chennai-16.

Date : 16/06/2017

Divisional Engineer(A)

RGM TTC, Chennai-16.

ECE - 314175712097

एनटीपीसी NTPC
एक महारत्न कम्पनी

# Simhadri Super Thermal Power Station

**Human Resources Department**
**Employee Development Centre**
**Visakhapatnam - 531 020**

सिम्हाद्रि
SIMHADRI

No. : SMPP/HR/EDC/

## CERTIFICATE

Date : 22-05-2017

This is to Certify that Mr. / ~~Mrs~~ / ~~Ms~~ K.V.S. Mahesh

of S.R.K.R Engg College

affiliated to Andhra University University has undertaken a

Training / Study / Project Work on Working of Thermal Power Plant & Intro to D.C.S.

at **NTPC** Simhadri Super Thermal Power Station, Visakhapatnam from 08/05/2017 to 21/05/2017

in partial fulfillment of BE- ECE

He / She has completed the training satisfactorily and submitted a report. His / Her conduct was

Good during the above period.

We wish sucess in his/her future endeavor

डॉ. सी. ज्योति बाबू / Dr. C. JYOTHI BABU
अपर महा प्रबंधक (क.वि.के.)
Additional General Manager (EDC)
एन.टी.पी.सी. सिम्हाद्रि / NTPC-Simhadri
विशाखपट्टणम्-VISAKHAPATNAM-20.

***AGM / Manager (HR - EDC)***

राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited
विशाखपट्टणम इस्पात संयंत्र Visakhapatnam Steel Plant
तकनीकी प्रशिक्षण केन्द्र Technical Training Institute
विशाखपट्टणम Visakhapatnam-530031

No. 2016/ 0009713 **प्रमाण पत्र CERTIFICATE** S17/OUTNG1983-0233

प्रामाणित किया जाता है कि श्री/*This is to certify that*

*Mr./Ms.* GORTHI SAI PRIYANKA *a student of*

(वर्ष/पाठ्यक्रम/शाखा *Year/Course/Branch/* III/B.E/MECHANICAL

विध्यार्थी ने *from* SRKR ENGINEERING COLLEGE, BHIMAVARAM से

*has undergone* INTERNSHIP प्रशिक्षण *training* विशाखपट्टणम इस्पात संयंत्र

के *at Visakhapatnam Steel Plant in* POWER ENGINEERING MAINTENANCE

विभागों में *depts. from* दि 08/05/2017 से *to* 20/05/2017 तक प्राप्त किया।

परियोजना शीर्षक *The project title is* ----------

है।

प्रशिक्षण अवधि में उनका आचरण *His/Her conduct during the period of training is*

GOOD है।

स्थल/Place : Visakhapatnam

दि/Date 20/05/2017

प्रक्षिण समन्वयक के हस्ताक्षर मोहर के साथ।
*Signature of Training Co-Ordinator with Seal*
जे. प्रभाकर राव -J. PRABHAKAR RAO
प्रबंधक(प्रशि.)-Manager(Trg.)
तकनीकी प्रशिक्षण संस्थान
Technical Training Institute
विशाखपट्टणम इस्पात संयंत्र
Visakhapatnam Steel Plant
विशाखपट्टणम-Visakhapatnam-530 031

राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited
विशाखपट्टणम इस्पात संयंत्र Visakhapatnam Steel Plant
तकनीकी प्रशिक्षण केन्द्र Technical Training Institute
विशाखपट्टणम Visakhapatnam-530031

0001654
0001654

# प्रमाण पत्र CERTIFICATE

S1801TN01739-0192

प्रामाणित किया जाता है कि श्री/*This is to certify that*

Mr./Ms. GORANTLA KAVYA *a student of*

पाठ्यक्रम/शाखा *Year/Course/Branch/* III/B TECH/MECHANICAL

छात्रार्थी ने *from* SRKR ENGINEERING COLLEGE, BHIMAVARAM से

*has undergone* INTERNSHIP प्रशिक्षण *training* विशाखपट्टणम इस्पात संयंत्र

*at Visakhapatnam Steel Plant in* LIGHT & MEDIUM MERCHANT MILL

विभागों में *depts. from* दि 04/06/2018 से *to* 16/06/2018 तक प्राप्त किया।

परियोजना शीर्षक *The project title is* **********

है।

प्रशिक्षण अवधि में उनका आचरण *His/Her conduct during the period of training is*

GOOD है।

स्थल/Place : Visakhapatnam

दि/Date 16/06/2018

प्रक्षिण समन्वयक के हस्ताक्षर मोहर के साथ।
*Signature of Training Co-Ordinator with Seal*

Technical Training Institute
आर आई एन एल विशाखपट्टणम इस्पात संयंत्र
RINL,Visakhapatnam Steel Plant
विशाखपट्टणम-Visakhapatnam-530 031

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राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited
विशाखपट्टणम इस्पात संयंत्र Visakhapatnam Steel Plant
तकनीकी प्रशिक्षण संस्थान Technical Training Institute
विशाखपट्टणम Visakhapatnam-530031

# प्रमाण पत्र CERTIFICATE

0000931

S17021N02479-0317

प्रामाणित किया जाता है कि श्री/*This is to certify that*

*Mr./Ms.* A B M SIVAKUMAR *a student of*

वर्ष/पाठ्यक्रम/शाखा *Year/Course/Branch/* III/B E/MECHANICAL

विद्यार्थी ने *from* SRKR ENGINEERING COLLEGE, BHIMAVARAM से

*has undergone* INTERNSHIP प्रशिक्षण *training* विशाखपट्टणम इस्पात संयंत्र

*at Visakhapatnam Steel Plant in* FIELD MACHINERY DEPARTMENT

विभागों में *depts. from* दि 05/06/2017 से *to* 17/06/2017 तक प्राप्त किया।

परियोजना शीर्षक *The project title is* **********

है।

प्रशिक्षण अवधि में उनका आचरण *His/Her conduct during the period of training is*

GOOD है।

स्थल/Place : Visakhapatnam

दि/Date 17/06/2017

प्रशिक्षण समन्वयक के हस्ताक्षर मोहर के साथ।
*Signature of Training Co-Ordinator with Seal*

के. अन्थोनी - K. ANTHONY
सहायक महा प्रबंधक (प्रशि)
Asst. General Manager (Trg.)
तकनीकी प्रशिक्षण संस्थान
Technical Training Institute
आर आई एन एल, विशाखपट्टणम इस्पात संयंत्र
RINL, Visakhapatnam Steel Plant
विशाखपट्टणम-Visakhapatnam-530 031

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राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited
विशाखपट्टणम इस्पात संयंत्र Visakhapatnam Steel Plant
तकनीकी प्रशिक्षण केन्द्र Technical Training Institute
विशाखपट्टणम Visakhapatnam-530031

No. 2016/ 0009820
0009820

# प्रमाण पत्र CERTIFICATE

S17/01TN01093-0340

प्रामाणित किया जाता है कि श्री/*This is to certify that*

*Mr./Ms.* SYED ARMED SHARIEF *a student of*

(वर्ष/पाठ्यक्रम/शाखा *Year/Course/Branch/* III/B.E/MECHANICAL

विध्यार्थी ने *from* SRKR ENGINEERING COLLEGE,BHIMAVARAM से

*has undergone* INTERNSHIP प्रशिक्षण *training* विशाखपट्टणम इस्पात संयंत्र

के *at Visakhapatnam Steel Plant in* ENGINEERING SHOPS & FOUNDRY

विभागों में *depts. from* दि 08/05/2017 से *to* 20/05/2017 तक प्राप्त किया।

परियोजना शीर्षक *The project title is* **********

है।

प्रशिक्षण अवधि में उनका आचरण *His/Her conduct during the period of training is*

GOOD है।

स्थल/Place : Visakhapatnam

दि/Date 20/05/2017

प्रशिक्षण समन्वयक के हस्ताक्षर मोहर के साथ।
*Signature of Training Coordinator with Seal*

प्रबंधक(प्रशि.)/Manager(Trg.)
तकनीकी प्रशिक्षण संस्थान
Technical Training Institute
विशाखपट्टणम इस्पात संयंत्र
Visakhapatnam Steel Plant
विशाखपट्टणम-Visakhapatnam-530 031

Oil and Natural Gas Corporation Ltd.
Rajahmundry Asset, K.G. P.G. Basin Gothan Bhavan Base Complex, Rajahmundry - 533 106. (A.P.)
Phone : 2431570 - 85 Fax : 0883-2427788

3141 75 720191

STAFF TRAINING INSTITUTE

RAJAHMUNDRY

RJY/ STI / PW/198 /2017-18 Date:08.06.2017

## INTERNSHIP COMPLETION REPORT

This is to certify that **Mr.RAGHUMANDA VAMSI KRISHNA, student of B.E (MECHANICAL ENGINEERING), at** SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE , BHIMAVARAM has Undergone Internship at ONGC, Rajahmundry Asset, **"A STUDY ON OIL AND GAS EXPLORATION ACTIVITIES IN KG BASIN"** With Reference to ONGC LTD under the guidance of Shri **K.SOMA SEKHAR , DGM (MECHANICAL), ONGC,** Rajahmundry .

During the Internship he took keen interest in the assigned work. We wish him all success in his academic endeavours and life.

G. Srisam

HR EXECUTIVE

Staff Training Institute,

ONGC, Rajahmundry.

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3141757 20201

# Oil and Natural Gas Corporation Ltd.

Rajahmundry Asset / K.G. P.G. Basin, Gokavaram Bypass, Base Complex, Rajahmundry - 533 106, A.P.
Phone : 2431570 - 85, Fax : 0883-2427768

STAFF TRAINING INSTITUTE

RAJAHMUNDRY

RJY/ STI / PW/199 /2017-18

Date:08.06.2017

## INTERNSHIP COMPLETION REPORT

This is to certify that **Mr.SAPPARAPU SYAM KUMAR**, student of B.E (MECHANICAL ENGINEERING), at SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE , BHIMAVARAM has Undergone Internship at ONGC, Rajahmundry Asset, **"A STUDY ON OIL AND GAS EXPLORATION ACTIVITIES IN KG BASIN"** With Reference to ONGC LTD under the guidance of **Shri K.SOMA SEKHAR , DGM (MECHANICAL),** ONGC, Rajahmundry .

During the Internship he took keen interest in the assigned work. We wish him all success in his academic endeavours and life.

HR EXECUTIVE

Staff Training Institute,

ONGC, Rajahmundry.

8.6.17

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భారత్ హెవీ ఎలక్ట్రికల్స్ లిమిటెడ్

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

BHARAT HEAVY ELECTRICALS LIMITED

Heavy Power Equipment Plant, Ramachandrapuram, Hyderabad - 502032 (INDIA)

మానవ వనరుల వికాస కేంద్రము / मानव संसाधन विकास केंद्र

Human Resources Development Centre

पंजीयन संख्या / Reg. No. 0160

दिनांक / Date 20/05/2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/ सुश्री/ श्रीमति This is to certify that Mr. / Ms. / Mrs. GOURU ADITYA KUMAR अनुक्रमांक / Roll No. 315175720088 ने of SAGI RAMA KRISHNAM RAJU ENGINEERING महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing Mechanical Engineering पाठ्यक्रम में /Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed the Project Work / Internship Training from दिनांक Dt. 08/05/17 से to दिनांक Dt. 20/05/17 तक सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is STUDY OF MANUFACTURING OF GAS TURBINE, STEAM TURBINE AND COMPRESSORS

ISO 9002

Accredited by the Dutch Council for Certification

20/05/2017

के. श्रीनिवासनायुडु

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

भी एच ई एल / BHEL, R.C.PURAM.

HYDERABAD-502 032

पंजीकृत कार्यालय – "भीएचईएल हाउस", सिरी फोर्ट, नई दिल्ली – 110 049

Regd. Office: "BHEL House", Siri Fort, New Delhi – 110 049

Website: www.bhel.com

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MECH - 315175720136

భారత్ హెవీ ఎలక్ట్రికల్స్ లిమిటెడ్
హెవీ పవర్ ఎక్విప్మెంట్ ప్లాంట్, రామచంద్రాపురం, హైదరాబాద్ – 502032 (భారత్)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी पावर इक्विपमेंट प्लांट, रामचन्द्रापुरम, हैदराबाद – 502 032 (भारत)
BHARAT HEAVY ELECTRICALS LIMITED
Heavy Power Equipment Plant, Ramachandrapuram, Hyderabad - 502032 (INDIA)

बी एच ई एल BHEL Maharatna Company

మానవ వనరుల వికాస కేంద్రము / मानव संसाधन विकास केंद्र
Human Resources Development Centre

पंजीयन संख्या / Reg. No. 0162 दिनांक / Date: 20/05/2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/ सुश्री/ श्रीमति This is to certify that Mr. / Ms. / Mrs. LANKA PRAKASH

अनुक्रमांक / Roll No. 315175720136 ने of S.R.K.R Engineering

महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing Mechanical engineering पाठ्यक्रम में /Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed the Project Work / Internship Training from दिनांक Dt. 5/5/17 से to दिनांक Dt. 26/5/17 तक सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is STUDY OF MANUFACTURING GAS TURBINE, STEAM TURBINE AND COMPRESSORS.

BVQi ISO 9002

Accredited by the Dutch Council for Certification

20/05/2017
के. श्रीनिवासनायुडु
परियोजना प्रशिक्षण प्रभारी
Project Training In-Charge



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MECH - 315175202 73

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

BHARAT HEAVY ELECTRICALS LIMITED

Human Resources Development Centre

पंजीयन संख्या / Reg. No. 0159 दिनांक / Date 20/05/2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/ सुश्री/ श्रीमति This is to certify that Mr. / Ms. / Mrs. VANDRAPU VENKATA NAGASUMA RAO

अनुक्रमांक / Roll No. 315175202 73 ने of SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE

महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing B TECH

MECHANICAL पाठ्यक्रम में /Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed

the Project Work / Internship Training from दिनांक Dt. 08-05-2017 से to दिनांक Dt. 20-05-2017 तक

सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is STUDY OF

MANUFACTURING OF STEAM TURBINE, GAS TURBINE AND COMPRESSOR

ISO 9002

Accredited by the Dutch Council for Certification

20.05.2017

के. श्रीनिवासराव

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

बी एच ई एल / BHEL, R C PURAM,

HYDERABAD-502 032

पंजीकृत कार्यालय - "बीएचईएल हाउस", सिरी फोर्ट, नई दिल्ली - 110 049

Regd. Office: "BHEL House", Siri Fort, New Delhi - 110 049

Website: www.bhel.com

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భారత్ హెవీ ఎలక్ట్రికల్స్ లిమిటెడ్

హెవీ పవర్ ఎక్విప్మెంట్ ప్లాంట్, రామచంద్రాపురం, హైదరాబాద్ – 502032 (భారత్)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

हेवी पावर इक्विपमेंट प्लांट, रामचन्द्रापुरम, हैदराबाद – 502 032 (भारत)

BHARAT HEAVY ELECTRICALS LIMITED

Heavy Power Equipment Plant, Ramachandrapuram, Hyderabad - 502032 (INDIA)

మానవ వనరుల వికాస కేంద్రము / मानव संसाधन विकास केंद्र

Human Resources Development Centre


पंजीयन संख्या / Reg. No. 0161

दिनांक / Date: 20/05/2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/ सुश्री/ श्रीमति This is to certify that Mr. / Ms. / Mrs. Korukonda Jyothi Sunny Kumar

अनुक्रमांक / Roll No. 315125220141 ने of Sri Ramakrishnam Raju Engineering college

महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing B. Tech

Mechanical Engineering पाठ्यक्रम में /Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed

the Project Work / Internship Training from दिनांक Dt. 8th may 2017 से to दिनांक Dt 20 may 2017 तक

सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is study of manufacturing

process of steam turbine and compressor and gas turbines.

ISO 9002

Accredited by the Dutch Council for Certification

20.05.17

के. श्रीनिवासनायुडु

मानव संसाधन अधिकारी / मा.सं.वि.

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

बी एच ई एल / BHEL, R.C.PURAM,

HYDERABAD-502 032



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MECH - 315175720126

राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited
विशाखपट्टणम इस्पात संयंत्र Visakhapatnam Steel Plant
तकनीकी प्रशिक्षण केन्द्र Technical Training Institute
विशाखपट्टणम Visakhapatnam-530031

No. 0000631
0000631

# प्रमाण पत्र CERTIFICATE

S1801TNO2022-0299

प्रामाणित किया जाता है कि श्री/*This is to certify that*

*Mr./Ms.* KAVITAPU DEEPIKA *a student of*

(वर्ष/पाठ्यक्रम/शाखा *Year/Course/Branch/* III/B E/MECHANICAL

विध्यार्थी ने *from* SRKR ENGINEERING COLLEGE, BHIMAVARAM से

*has undergone* INTERNSHIP प्रशिक्षण *training* विशाखपट्टणम इस्पात संयंत्र

के *at Visakhapatnam Steel Plant in* MEDIUM MERCHANT & STRUCTURAL MILL

विभागों में *depts. from* दि 07/05/2018 से *to* 19/05/2018 तक प्राप्त किया।

परियोजना शीर्षक *The project title is* **********

है।

प्रशिक्षण अवधि में उनका आचरण *His/Her conduct during the period of training is*

GOOD है।

स्थल/Place : Visakhapatnam

दि/Date 19/05/2018

प्रक्षिण समन्वयक के हस्ताक्षर मोहर के साथ।
*Signature of Training Co-Ordinator with Seal*

जे. प्रभाकर राव - J. PRABHAKARA RAO
प्रबंधक (प्रशिक्षण) - Manager (Trg.)
तकनीकी प्रशिक्षण संस्थान
Technical Training Institute
आर आई एन एल विशाखपट्टणम इस्पात संयंत्र
RINL Visakhapatnam Steel Plant
विशाखपट्टणम-Visakhapatnam-530031

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भारत हैवी इलेक्ट्रिकल्स लिमिटेड

BHARAT HEAVY ELECTRICALS LIMITED

Human Resources Development Centre

पंजीयन संख्या / Reg No 0435 दिनांक / Date 29-05-2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री सुश्री श्रीमति This is to certify that Mr / Ms / Mrs G. LAKSHMAN GANESH

अनुक्रमांक / Roll No 315175720037 के of S.R.K.R ENGINEERING COLLEGE

महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing 3/4 B.E MECHANICAL

ENGINEERING पाठ्यक्रम में / Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed

the Project Work / Internship Training from दिनांक Dt 15-05-2017 से to दिनांक Dt 29-05-2017 तक

सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is

STUDY OF STEAM TURBINES

ISO 9002

Accredited by The Dutch Council for Certification

K. Sandeep
29/05/2017

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

के.एन. संदीप

K N SANDEEP

Executive Trainee

पंजीकृत कार्यालय - "भेल हाउस", सिरी फोर्ट, नई दिल्ली - 110 049

Regd. Office: "BHEL House", Siri Fort, New Delhi - 110 049

Website: www.bhel.com

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భారత్ హెవీ ఎలక్ట్రికల్స్ లిమిటెడ్

హెవీ పవర్ ఎక్విప్మెంట్ ప్లాంట్, రామచంద్రాపురం, హైదరాబాద్ – 502032 (భారత్)

बी एच ई एल

BHEL

Maharatna Company

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

हेवी पावर इक्विपमेंट प्लांट, रामचन्द्रापुरम, हैदराबाद – 502 032 (भारत)

BHARAT HEAVY ELECTRICALS LIMITED

Heavy Power Equipment Plant, Ramachandrapuram, Hyderabad - 502032 (INDIA)

మానవ వనరుల వికాస కేంద్రము / मानव संसाधन विकास केंद्र

Human Resources Development Centre

पंजीयन संख्या / Reg. No. 0476 दिनांक / Date: 29-05-2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/ सुश्री/ श्रीमति This is to certify that Mr. / Ms. / Mrs. GUDLA VAMSY KRISHNA

अनुक्रमांक / Roll No. 315175720093 ने of S.R.K.R ENGINEERING COLLEGE

महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing 3/4 B.E MECHANICAL

ENGINEERING पाठ्यक्रम में /Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed

the Project Work / Internship Training from दिनांक Dt. 15-05-2017 से to दिनांक Dt 29-05-2017 तक

सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is

STUDY OF STEAM TURBINES

BVQi

ISO 9002

Accredited by the Dutch Council for Certification

K. Sandeep 29/05/2017

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

के एन संदीप

K N SANDEEP

कार्यपालक / Executive

पंजीकृत कार्यालय – "बीएचईएल हाउस", सिरी फोर्ट, नई दिल्ली – 110 049

Regd. Office: "BHEL House", Siri Fort, New Delhi - 110 049

Website: www.bhel.com

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भारत हेवी इलेक्ट्रिकल्स लिमिटेड

BHEL

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

BHARAT HEAVY ELECTRICALS LIMITED

Heavy Power Equipment Plant, Ramachandrapuram, Hyderabad - 502032 (INDIA)

Human Resources Development Centre

पंजीयन संख्या / Reg No 0477

दिनांक / Date 29/5/2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/ सुश्री/ श्रीमति This is to certify that Mr / Ms / Mrs J. Sai Nagarjuna अनुक्रमांक / Roll No 315175720107 ने of S.R.K.R Engineering college महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing B.Tech, Mechanical पाठ्यक्रम में /Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed the Project Work / Internship Training from दिनांक Dt. 15/5/2017 से to दिनांक Dt 29/5/2017 तक सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is STUDY OF STEAM TURBINES

BVQI

ISO 9002

Accredited by the Dutch Council for Certification

K. Sandeep
29/01/2017

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

K N SANDEEP

पंजीकृत कार्यालय – "बीएचईएल हाउस", सिरी फोर्ट, नई दिल्ली – 110 049

Regd. Office: "BHEL House", Siri Fort, New Delhi – 110 049

Website: www.bhel.com

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(39)

17-18

భారత్ హెవీ ఎలక్ట్రికల్స్ లిమిటెడ్

హెవీ పవర్ ఎక్విప్మెంట్ ప్లాంట్, రామచంద్రాపురం, హైదరాబాద్ – 502032 (భారత్)

बी एच ई एल

BHEL

Maharatna Company

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

हेवी पावर इक्विपमेंट प्लांट, रामचन्द्रापुरम, हैदराबाद – 502 032 (भारत)

BHARAT HEAVY ELECTRICALS LIMITED

Heavy Power Equipment Plant, Ramachandrapuram, Hyderabad – 502032 (INDIA)

మానవ వనరుల వికాస కేంద్రము / मानव संसाधन विकास केंद्र

Human Resources Development Centre

पंजीयन संख्या / Reg. No. 0479 दिनांक / Date: 29-05-2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/ सुश्री/ श्रीमति This is to certify that Mr. / Ms. / Mrs. KALLOJU SOHEL

अनुक्रमांक / Roll No. 15S17S7201S ने of SRKR ENGINEERING COLLEGE

महाविद्यालय / विश्वविद्यालय / college / university से अध्ययन करते हुए pursuing 3rd B.TECH

MECHANICAL पाठ्यक्रम में /Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed

the Project Work / Internship Training from दिनांक Dt. 15-05-2017 से to दिनांक Dt. 29-05-2017 तक

सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is STUDY OF

STEAM TURBINES

BVQI

ISO 9002

Accredited by the Dutch Council for Certification

K. Sandeep
29/05/2017

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

A.M. SANDEEP

पंजीकृत कार्यालय – "बीएचईएल हाउस", सिरी फोर्ट, नई दिल्ली – 110 049

Regd. Office: "BHEL House", Siri Fort, New Delhi – 110 049

Website: www.bhel.com

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MECH - 3151757 20114

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भारत हेवी इलेक्ट्रिकल्स लिमिटेड

BHARAT HEAVY ELECTRICALS LIMITED

Human Resources Development Centre

पंजीकृत संख्या / Reg. No. [illegible] दिनांक / Date 24-05-2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री / Mr. / Mrs. K. Anil Kumar

अनुक्रमांक / Roll No. 315175720114 ने / of Indus Institute of Engineering & Technology

महाविद्यालय / विश्वविद्यालय / college / university में अध्ययन करते हुए / pursuing B.Tech

Mechanical पाठ्यक्रम में / Course परियोजना कार्य / इण्टर्नशिप प्रशिक्षण has satisfactorily completed

the Project Work / Internship Training from दिनांक / Dt. 15-05-2017 से / to दिनांक / Dt. 25-05-2017 तक

सन्तोषजनक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is Study of Steam Turbines

ISO 9002

K. Sanjay
24/05/2017

परियोजना प्रशिक्षण प्रभारी

Project Training In Charge

कॉर्पोरेट कार्यालय: "BHEL House", Siri Fort, New Delhi - 110 049

Regd. Office: "BHEL House", Siri Fort, New Delhi - 110 049

Website: www.bhel.com

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MECH - 76

39

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

BHARAT HEAVY ELECTRICALS LIMITED

Human Resources Development Centre

पंजीकरण संख्या / Reg. No. 0480 दिनांक / Date 29/05/2017

# परियोजना कार्य प्रशिक्षण प्रमाण पत्र

# PROJECT WORK TRAINING CERTIFICATE

प्रमाणित किया जाता है कि श्री/सुश्री/श्रीमति This is to certify that Mr. / Ms. / Mrs. Gadigatla Harish

अनुक्रमांक / Roll No. 315175120016 के of GRKR Engineering College

महाविद्यालय / विश्वविद्यालय / college / university में अध्ययन करते हुए pursuing 3/4 b.tech

mechanical पाठ्यक्रम में Course परियोजना कार्य / इंटर्नशिप प्रशिक्षण has satisfactorily completed

the Project Work / Internship Training from दिनांक Dt. 15-05-2017 से to दिनांक Dt. 29-05-2017 तक

सफलतापूर्वक पूर्ण किया है। परियोजना कार्य का शीर्षक / The title of the project is

Study of steam turbines

K. Sandeep
29/05/2017

परियोजना प्रशिक्षण प्रभारी

Project Training In-Charge

ISO 9002

Regd. Office: "BHEL House", Siri Fort, New Delhi - 110 049

Website: www.bhel.com

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राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited
विशाखपट्टणम इस्पात संयंत्र Visakhapatnam Steel Plant
तकनीकी प्रशिक्षण संस्थान Technical Training Institute
विशाखपट्टणम Visakhapatnam-530031

VIZAG STEEL Pride of Steel
A Navratna Company

0000720

# प्रमाण पत्र CERTIFICATE

S1701TN02898-0106

प्रामाणित किया जाता है कि श्री/*This is to certify that*

*Mr./Ms.* MOHAMMAD ZULKARNINE *a student of*

(वर्ष/पाठ्यक्रम/शाखा *Year/Course/Branch/* III/B E/MECHANICAL

विध्यार्थी ने *from* SRKR ENGINEERING COLLEGE, BHIMAVARAM से

*has undergone* INTERNSHIP प्रशिक्षण *training* विशाखपट्टणम इस्पात संयंत्र

के *at Visakhapatnam Steel Plant in* CALCINING & REFRACTORY MATERIAL PLANT

विभागों में *depts. from* दि 05/06/2017 से *to* 17/06/2017 तक प्राप्त किया।

परियोजना शीर्षक *The project title is* **********

प्रशिक्षण अवधि में उनका आचरण *His/Her conduct during the period of training* GOOD है।

स्थल/Place : Visakhapatnam

दि/Date 17/06/2017

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Asst. General Manager (Trg.)
तकनीकी प्रशिक्षण संस्थान
Technical Training Institute
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1. Design of fixture for holding the tooling of IC STUD tightening machine.
2. Design of holding positions for side inlet injectors on line 6.

We wish him success in his future endeavours.

Yours sincerely,
For Bosch Limited,

**Raghavendra G**
Deputy Manager
Manufacturing

**Sneha Oak**
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# CERTIFICATE

Date : 12/06/2017

This is to Certify that Mr. / Mrs / Ms MUTHE LAKSHMI NARAYANA
of SAGI RAMAKRISHNAM RAJU ENGINEERING COLLEGE, BHIMAVARAM, W.G(Dist.), AP.
affiliated to ANDHRA UNIVERSITY University has undertaken a
Training / Study / Project Work on PERFORMANCE OF THERMAL POWER PLANT; M.M. Dept.
at NTPC Simhadri Super Thermal Power Station, Visakhapatnam from 29/05/2017 to 12/06/2017
in partial fulfillment of B.E.: MECHANICAL ENGINEERING

He / She has completed the training satisfactorily and submitted a report. His / Her conduct was Good during the above period.

We wish sucess in his/her future endeavor

Kalyan Lam
AGM / Manager (HR - EDC)

NTPC-SIMHADRI
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DESIGN
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HR * EDC

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# Spatiotemporal Data Modeling for Grid Based Subspace Clustering

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**Abstract**
This paper explains different data preprocessing techniques that are to be applied on spatiotemporal data to improve the quality and make it appropriate for grid based subspace clustering. The choice of data preprocessing techniques should be based on the nature of the data and the purpose for which it is used. Two real world datasets namely animal migration data and weather data are taken as case studies. Animal migration dataset is animal movement data annotated with weather parameters obtained by integrating the data collected from MoveBank and IRI/LDEO Climate Data Library of Columbia University. Weather dataset is the Cambridge daily weather data collected on the rooftop of University of Cambridge. Data Cleaning, data Integration, data transformation and data reduction techniques were applied on animal migration data. Data cleaning, data transformation and data reduction techniques are applied on Cambridge Weather data.

**Keywords:** Spatiotemporal data, multivariate time series, data preprocessing.

## Introduction

Data mining is extraction of knowledge or patterns from huge amounts of data. The patterns extracted by data mining will be correct and of high quality only if the data is of high quality. Data collected in any real world database contain errors, missing values. The data required for a particular analysis task may be distributed in different databases. Due to the sophisticated data collection equipment data is easily collected and stored instantaneously as it is generated. This leads to huge amounts of data.

For effective and efficient data mining every real world dataset need to be preprocessed before applying data mining. The different data preprocessing technique are data cleaning, data integration, data transformation and data reduction [1]. Data cleaning techniques help in removing noise or errors and fill missing values. If the data that is relevant for a particular data mining task is distributed in different data sources it has to be collected from different data sources and converted to required format by data integration and data transformation techniques. Many data mining algorithms fail to mine the patterns if data size is huge. Even if an algorithm can handle huge amounts of data, it will generate huge number of patterns at high granularity and it will become difficult or impossible to comprehend the generated patterns. So data need to be converted from high granularity to low granularity using data reduction techniques.

There are a number of data cleaning, data integration, data transformation and data reduction techniques proposed in the literature. This paper argues that the selection of data preprocessing techniques should be based on the nature of data and on the type of patterns we intend to extract from the data. The paper explains the different preprocessing techniques that are to be applied on the data inorder to make it suitable for grid based subspace clustering by taking spatiotemporal data and multivariate time series (temporal data) as case studies.

Clustering aims at grouping objects such that all the objects in each group share similar characteristics. In traditional clustering all the variables/dimensions describing the objects are used in calculating the similarity between objects. The clusters that exist in subset of attributes are called as subspace clusters. A subspace cluster is defined as follows

Let $D = O \times A$ be a dataset represented in the form matrix, where **O** is the set of objects and **A** is the set of attributes. A subspace cluster **C** is a submatrix $O \times A$ , where the set of objects $O \subseteq \mathbf{O}$ is homogeneous in the set of attributes defined by the subspace $A \subseteq \mathbf{A}$ [2]

Subspace clusters where members of the clusters share similar characteristics in subset of attributes could not be detected in traditional clustering. Hence many subspace clustering algorithms are proposed in the literature. Based on the approach taken these algorithms can be classified as grid based, density based and window based algorithms.

Grid based subspace clustering partitions the data space into *n*-dimensional grid. Each grid cell holds the data objects that satisfy the constraints imposed by the attribute value pairs defining the grid cell. The grid cells whose density is greater than the given threshold are called as interesting subspaces. The density of a grid cell is defined as the ratio of number of objects in the cell to the total number of objects. After identifying interesting subspaces at each dimensionality, clusters are formed by grouping dense connected subspaces.

The different data preprocessing techniques that are to be applied to make a dataset suitable for grid based subspace clustering are discussed by taking two different types of datasets as case studies. The first dataset is animal migration data taken from MoveBank which is a spatiotemporal data [3][4]. The second is climatic data collected from university

Data in Brief 12 (2017) 287–304

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

# Data of 10 SSR markers for genomes of homo sapiens and monkeys

K.K.V.V.S. Reddy [a], S.Viswanadha Raju [b], Chinta Someswara Rao [c]

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ABSTRACT

In this data, we present 10 Simple Sequence Repeat(SSR) markers TAGA, TCAT, GAAT, AGAT, AGAA, GATA, TATC, CTTT, TCTG and TCTA which are extracted from the genomes of homo sapiens and monkeys using string matching mechanism [1]. All loci showed 4 Base Pair(bp) in allele size, indicating that there are some polymorphisms between individuals correlating to the number of SSR repeats that maybe useful for the detection of similarity among the genotypes. Collectively, these data show that the SSR extraction is a valuable method to illustrate genetic variation of genomes.

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**Specifications Table**

| | |
|---|---|
| Subject area | Bio-informatics |
| More specific subject area | Genomes of homo sapiens and monkeys |
| Type of data | Tables, figures |
| How data was acquired | SSR markers extraction with string matching |
| Data format | Analyzed |

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**Proceedings of the 4th International Conference on Frontiers in Intelligent Computing: Theory and Applications (FICTA) 2015** pp 153–166

# Mining Closed Interesting Subspaces to Discover Conducive Living Environment of Migratory Animals

G. N. V. G. Sirisha & M. Shashi

Conference paper | First Online: 25 October 2015

**687** Accesses | **2** Citations

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 404)

## Abstract

This paper presents the suitability of subspace clustering techniques to identify the conducive living environment of migratory animals given the geographical and weather conditions prevailing at various locations where the animals thrive. The set of collaborative weather and geographical conditions prevailing at different locations where animals move define the conducive living environment/conditions of animals and hence their accessibility in turn

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# A hash-based algorithm for mining non-redundant asynchronous periodic patterns

G.N.V.G. Sirisha and M. Shashi

Published Online: 31 Jan 2017

## Abstract

Periodic patterns occur in a wide variety of datasets like time series, temporal, spatiotemporal and biological datasets. Asynchronous periodic pattern mining discovers the patterns that appear significantly with strict periodicity in one or more subsequences called valid segments with tolerable disturbance between the valid segments. The state-of-the-art asynchronous periodic pattern mining algorithms proposed in the literature mine many redundant asynchronous periodic patterns. This paper proposes an algorithm to mine non-redundant asynchronous periodic patterns. It is a variation of a four-phase algorithm named SMCA. The proposed algorithm mines precise and concise set of non-redundant patterns whose number is in orders of magnitude smaller than that of previous methods. The proposed algorithm is explained using a hypothetical dataset and its performance is evaluated using three real data sets which are stock market data from Bombay Stock Exchange, Weather data from Cambridge University and Migratory Zebras' data from MoveBank.

## Keywords

asynchronous periodic patterns, non-redundant patterns, hash-based technique, multivariate time series, event set sequence, generic patterns, weather data, migratory zebras data, stock market data, stock markets, data mining, pattern mining

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Article

# A new approach for information collection from web with ontology

January 2016 · International Journal of Applied Engineering Research 11(9):6563-6567

**Authors:**

T.V.K.P. Prasad V. Dilip Kumar T. Srinivasa Rao D. Madhu Babu

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Citations (1)

Abstract

As a model for knowledge description and formalization, ontologisms are widely used to represent user profiles in personalized web information gathering. However, when representing user profiles many models have utilized only knowledge from either a global knowledge base or user local information. In this paper, a personalized ontology model is proposed for knowledge representation and reasoning over user profiles. This model learns ontological user profiles from both a world knowledge base (WKB) and user local instance repositories (LIR).

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... In [6], new methods of sentiment analysis have been mentioned that are used in extracting opinions out of feedbacks. In [7] , Dilip Kumar et al use user's local instance repository and world knowledge base to discover background knowledge about user and create personalized ontology. This is a disadvantage as entry table which acts as WKB is essentially the same for most users. ...

**Adaptive Feedback System for Websites based on User Classification**

Article

Sep 2016

Garric Mathias · Naina Bharadwaj · Falguni Bharadwaj

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ONTOLOGY TECHNIQUES FOR WEB DATA

January 2014

A.ESWARA RAO · G. V. S. SOWMYA · P.N. SAILAKSHMI

This paper p r e s e n t s techniques for knowledge description and formalization, ontologies are used to represent user profiles in personalized web data. However, when representing user profiles, many models or techniques have utilized only knowledge from either a global knowledge base or a user local information. In this paper, a personalized ontology model is proposed for knowledge ... [Show full abstract]

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# A Novel Approach to Telugu Stemming Using N-gram Process

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***Abstract:*** The ability of an Information Retrieval (IR) system to conflate the words allows reducing index and enhancing recall sometimes even without significant deterioration of precision. Conflation also conforms to user's intuition because users don't need to worry about the "proper" morphological form of words in a query. The problem of automated conflation implementation is known as "stemming" algorithm. One of the key solutions in conflation algorithms is if an automated stemming can be as much efficient (for IR purposes) as a manual processing. For this purpose in this paper, stemming methodology using N-gram is proposed which increases the efficiency of the Telugu IRS.

***Keywords:*** Information Retrieval System; IRS; Stemming; N-gram; Conflation

## 1. INTRODUCTION

In linguistic morphology and information retrieval, stemming is the process of reducing inflected words to their word stem, base or root form—generally a written word form [1]. The stem need not be identical to the morphological root of the word; it is usually sufficient that related words map to the same stem, even if this stem is not in itself a valid root. Algorithms for stemming have been studied in computer science since the 1960s.

Stemming is common form of language processing in most Information Retrieval (IR) systems [2]. Word stemming is an important feature supported by present day indexing and search systems. Idea is to improve recall by automatic handling of word endings by reducing the words to their word roots, at the time of indexing and searching. Stemming is usually done by removing any attached suffixes, and prefixes from index terms before the assignment of the term. Since the stem of a term represents a broader concept than the original term, the stemming process eventually increases the number of retrieved documents [3,4,5].

Stemming broadens our results to include both word roots and word derivations [6,7,8]. In natural language processing, *conflation* is the process of merging or lumping together non-identical words, which refer to the

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# A New Multi Pattern Multi Processor Parallel String Matching Algorithm with While Shift

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***Abstract*:** In present days a huge volume of digital data is observed because of increasing usage of internet by so many people. Extraction of relevant information from these huge digital data is a difficult task, therefore information retrieval systems (IRS) need the high performance algorithms for searching. The information retrieval systems basically use the string matching algorithms, once the efficiency of the string matching algorithms is improved; the relevant retrieval efficiency of the information retrieval systems automatically increases. For this purpose in this paper, we propose multi pattern multi-processor parallel string matching algorithms for sequential and concurrent environments.

***Index Terms*:** Digital data, IRS, String matching, Multi pattern, parallel string matching

## 1. INTRODUCTION

String matching is one of the dominant concepts in computer science areas like text editors, text mining, data mining, forensics, intrusion detection systems, plagiarism, DNA sequence analysis and many more. Due to its wide range of application areas a number of algorithms were developed since 1970 [1, 2, 3, 4, 5, 6, 7]. String matching algorithms can be divided into single pattern and multi pattern algorithms. Based on the searching nature single pattern string matching can be classified as prefix, suffix and substring matching algorithms. In single pattern matching various string matching algorithms are proposed by different researchers. Brute force[1] is the first string matching algorithm, in which characters of the pattern are compared with text, if mismatch/ complete match occurs then it shifts exactly one position. Later Knuth-Moms-Pratt (KMP) [8] proposed another prefix based string matching algorithm, it also compares the first character of the pattern with first character of the text, if mismatch/complete match occurs then shift position decision is taken based on correctly matched characters. Boyer-Moore(BM)[9] is another single pattern matching algorithm, in which the right most character of the pattern is compared with the corresponding character of the text, if mismatch/ complete match occurs then it shifts the pattern based on good suffix and bad character rule. The BM has advantages and disadvantages, with these advantages and disadvantages many variants of BM have been developed.

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# A Fork Join Frame Work for Brute Force, Boyer Moore and Skip Search String Matching Algorithms

**S. Viswanadha Raju[a], K.K.V.V.V.S. Reddy[b] and Chinta Someswara Rao[c]**

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***Abstract:*** In present days information retrieval play the vital role in every one daily life. If retrieval system returns irrelevant information that lead to wastage of time and effort. For relevant information retrieval different researchers proposed retrieval algorithms, but still there is a necessity of these algorithms. For this purpose in this paper, we take Brute force, Boyer moore and Skip search retrieval algorithms from literature and converted them into parallel algorithms by adopting fork join concept. The parallel algorithms returns most relevant results as well as reduces the search time.

***Keywords:*** Information retrieval; Parallel, fork join; Brute force; Boyer moore; Skip search.

## 1. INTRODUCTION

There is a necessity for the improvement of the performance of searching on the current day text collections because of the exponential growth of textual databases with the time[1-6]. In retrieving the data from these textual databases, special purpose algorithms have been developed by the researchers, those are parallelizing the comparison[1-6]. But these algorithms are not full fill the users requirement, so still there is a scope of necessity to develop a text retrieval algorithms. For this purpose in this study, Brute force[7], Boyer moore[8] and Skip search[9] string matching algorithms are considered and convert them into parallel algorithms. In these parallel algorithms a number of comparisons will be performed parallel and reduced the search time.

## 2. LITERATURE SURVEY

This section three different string matching approaches Brute force, Boyer moore and Skip search that are basic to this study are discussed.

*Brute force[7]:* A basic algorithm in the study of string matching problem is the Brute Force (BF) algorithm. When the length of the text is n and the length of the pattern is m. The comparison will be performed one by

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# Similarity analysis between chromosomes of *Homo sapiens* and monkeys with correlation coefficient, rank correlation coefficient and cosine similarity measures

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ABSTRACT

In this paper, we consider correlation coefficient, rank correlation coefficient and cosine similarity measures for evaluating similarity between *Homo sapiens* and monkeys. We used DNA chromosomes of genome wide genes to determine the correlation between the chromosomal content and evolutionary relationship. The similarity among the *H. sapiens* and monkeys is measured for a total of 210 chromosomes related to 10 species. The similarity measures of these different species show the relationship between the *H. sapiens* and monkey. This similarity will be helpful at theft identification, maternity identification, disease identification, etc.

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## 1. Introduction

Similarity measures are most important operations used in analyzing genomic data. One of the most widely used analysis paradigm is guilt-by-association that requires for measuring the similarity between the pair of genes. Guilt-by-association is important for the analysis of genome interactions because relation of two neighbor genes is often easier to interpret than direct interactions between genes [1,2,3]. A genome interaction is a measure of how surprising a genome feature is similar when compared to phenomenon of another genome [4,5,6,7].

In this study we consider chromosomes of *Homo sapiens* and different kinds of monkeys called *Callithrix jacchus*, *Chlorocebus sabaeus*, *Gorilla gorilla*, *Macaca fascicularis*, *Macaca mulatta*, *Nomascus leucogenys*, *Pan troglodytes*, *Papio anubis* and *Pongo abelli*.

We also develop $2^0$ shaft string matching algorithm that consists of input & output, initialization, main function, search function and shift_left_to_right function. The genome sets and different patterns (TAGA, AGAA,GATA,TCTA,TCAT,GAAT,AGAT,CTTT,TATC,TCTG) are taken as input. The sample_id, sample_name, sample_chromosome_name, lineno, position, noofoccurences, codi are returned as output. multiple_pattern(all patterns in the set), n(text length), m(pattern length) and all the remaining variables required in the process are initialized. In the main function the genome set is read on chromosome by chromosome basis, the individual chromosome is given to shift_left_to_right function. The shift_left_to_right function takes the rightmost character of the pattern and compares it with the characters in the text. If match occurs the position (shift value) of the text is returned to the main function. Once it receives the shift value the search function is called. In the search process character by character is compared from both the directions until a complete match or missmatch occurs. In case match occurs the successive occurrence of the pattern is computed. If the successive occurrence size is greater than 2 then the data is stored in the data base(TandemRepeatDB). If mismatch occurs the same procedure is repeated until end of the text T. The relations created and stored in TandemRepeatDB data base with names of homo_sapiens, callithrix_jacchus, chlorocebus_sabaeus, gorilla_gorilla, macaca_fascicularis, macaca_mulatta, nomascus_leucogenys, pan_troglodytes, papio_anubis and pongo_abelli.

## 2. Materials and methods

In this study, four benchmarked similarity measures are consider and applied on the values of genome datasets of *H. sapiens*, *C. jacchus*, *C. sabaeus*, *G. gorilla*, *M. fascicularis*, *M. mulatta*, *N. leucogenys*, *P. troglodytes*, *P. anubis and P. abelli* [8]. The similarity measures studied in the paper are Correlation coefficient [9,10], Rank correlation coefficient [11,12] and Cosine similarity [13,14].

### 2.1. Correlation coefficient

A correlation coefficient [9,10] is a coefficient that illustrates a quantitative measure of correlation and dependence. It shows the statistical

* Corresponding author.

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# Next generation sequencing (NGS) database for tandem repeats with multiple pattern 2°-shaft multicore string matching

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ABSTRACT

Next generation sequencing (NGS) technologies have been rapidly applied in biomedical and biological research in recent years. To provide the comprehensive NGS resource for the research, in this paper , we have considered 10 loci/codi/repeats TAGA, TCAT, GAAT, AGAT, AGAA, GATA, TATC, CTTT, TCTG and TCTA. Then we developed the NGS Tandem Repeat Database (TandemRepeatDB) for all the chromosomes of Homo sapiens, Callithrix jacchus, Chlorocebus sabaeus, Gorilla gorilla, Macaca fascicularis, Macaca mulatta, Nomascus leucogenys, Pan troglodytes, Papio anubis and Pongo abelii genome data sets for all those locis. We find the successive occurence frequency for all the above 10 SSR (simple sequence repeats) in the above genome data sets on a chromosome-by-chromosome basis with multiple pattern 2° shaft multicore string matching.

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## 1. Introduction

Since the completion of the first human genome sequence, demand for cheaper and faster sequencing methods has increased greatly. This demand has driven the development of second-generation sequencing methods, or next-generation sequencing (NGS). In this paper we developed NGS TandemRepeatDB that stores the successive occurence frequency of SSRs from the considered genomes.

Simple sequence repeats (SSRs) are tandemly repeated DNA sequences found in varying abundance in most genomes [1,2]. These repeats have been extensively used for genetic mapping and population studies [3]. SSRs also provide molecular tools to understand spatial relationships between chromosome segments, which in turn, aid in analyzing temporal relationships between species and genera [4]. In humans about 3% of the genome is occupied by SSRs [5].

The study of repeat frequency and its distribution pattern in the genome is expected to help in understanding their significance. There is accumulating evidence to suggest that SSRs function to regulate gene expression [6,7].

The availability of complete genome sequences for many organisms has made it possible to carry out genome-wide analyses. In the present study we have screened all the chromosomes of *Homo sapiens*, *Callithrix jacchus*, *Chlorocebus sabaeus*, *Gorilla gorilla*, *Macaca fascicularis*, *Macaca mulatta*, *Nomascus leucogenys*, *Pan troglodytes*, *Papio anubis* and *Pongo abelii* [8] and studied the distribution and successive occurrence frequency of TAGA, TCAT, GAAT, AGAT, AGAA, GATA, TATC, CTTT, TCTG, and TCTA locis [9,10].

Earlier, few studies [11–14] have attempted to analyze the distribution of tandem repeats in human like genomes but they are confined to a single or a small set of genomes. This tandem repeat mining helps in understanding and addressing biological questions. It is used in various diverse applications like *DNA finger printing*, *maternity identification*, *paternity identification*, *theft identification*, *suspect findings*, and *disease identification* [15,16,9,10].

## 2. Methodology

In the present paper, we constructed the TandemRepeatDB with multiple pattern 2° shaft multicore string matching algorithm. String matching [17–20] is a process of identifying the pattern (P) in a given text (T). In the present paper chromosomes of genomes are considered as text (T) and the locis are considered as patterns. The multiple pattern 2° shaft multi core string matching algorithm searches the multiple patterns concurrently in a single part (2° = 1 shaft) with multi core processors.

* Corresponding author.

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# A NOVEL MULTI PATTERN STRING MATCHING ALGORITHM WITH WHILE SHIFT

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## ABSTRACT

String matching plays a dominant role in digital computer world, because it is made up of huge digital information. Digital computer world users often face a problem to extract the relevant information from these huge digital data to their queries. Hence it requires efficient retrieval algorithms for retrieving relevant data from huge digital data. To retrieve relevant data, in this paper we proposed two retrieval algorithms called single pattern and multi pattern string matching algorithms with while shift.

## Keywords

Digital computer world; Digital data; String matching, Single pattern; Multi pattern.

## 1. INTRODUCTION

String matching is on extensively studied problem in computer science, since it accomplishes significant tasks in many applications like Information retrieval, Intrusion detection, Genome comparison (e.g. Human/Mouse), Phonebooks, Dictionaries, Search Engines, Bio-informatics(Partrinity identification, Matrinity identification, DNA finger printing) and many more[1,2]. These wide range of applications need the improverment in searching beacause digital data in World Wide Web(WWW) is increasing day by day[3,4,5,6]. Due to the exponential increase of digital data with time, the string matching becomes impractical in conventional computers[7].

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To search in huge digtal data, some researchers developed concurrent[8,9,10] algorithms that perfom the searching concurrently by general purpose concurrent computers that increase the efficiency and decreases the search time. Due to its wide scope of applications still there is wide requirement to develop the novel algorithms.

The main contributions of this work are summarized as follows. This work offers a comprehensive survey at various aspects. This work suggests the single pattern, multi pattern and multi directional multi pattern string matching algorithms for both single and multi-core processing. The rest of this work is organized as, reviewing typical algorithms, algorithmic models and finally concluding the study.

## 2. LITERATURE

Classical and advanced string matching algorithms have been proposed in literature, like brute force algorithm [11], which is invented in the dawn of computer history, later re-invented by many researchers, Knuth &Pratt[12] invented a better one in 1970, which is published in 1976 named as "Knuth-Morris-Pratt", it is also re-invented many times, Boyer & Moore[13] found a better one before 1976, which is published in 1977, it is also re-invented many times.

Aho-corasick[14] developed a finite automaton based string matching algorithm that accepts all the strings in the pattern set. In practice it becomes slow for a large pattern set because of the worse cache locality in accessing a large transition table.

In 1995, Lecroq[15] developed Quick Search string matching algorithm, which is an efficient algorithm when using a short pattern during the text search. It is revisited by Klaib et al.,[16] in 2007, but shows less efficient behavior for small patterns. In 1998, Charras et al.,[17] developed skip search for string matching, which shows an efficient behavior for long patterns.

In 2012, MA Naser[18] revisited quick search and skip search algorithms and proposed the Quick-Skip Search Hybrid Algorithm for the exact string matching . It fulfills quick and skip search algorithms problems. In 2010, Safaa O et.al.,[19] suggested distributed environment with enhancing the Snort's string matching engine through a LAN of computers, where each

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# Concurrent Information Retrieval System (IRS) for Large Volume of Data with Multiple Pattern Multiple ($2^N$) Shaft Parallel String Matching

Chinta Someswara Rao & S. Viswanadha Raju

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## Abstract

The internet revolution has made the digital information easy to capture, process, store, distribute, and transmit. There is a significant development in computation and related technologies. In different walks of life, there is ever expanding usage of these technologies. As a result there is a continuous collection and storage of huge amount of data of diverse characteristics in data bases. It is indeed a challenge for the retrieval of information from this enormous amount of data. The information retrieval is an attempt to make sense of the information explanation embedded in this huge volume of data. All these aspects suggest the need of intelligent data retrieval methodologies for the retrieval of useful information. In this paper, as a concurrent information retrieval system (IRS) with

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# Parametric studies on motion intensity factors in a Robotic Welding using Speech Recognition

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***Abstract:*** The manufacturing strategies have been modernised and became autonomous by using robotic control and voice control system. Factors analysed for effectiveness of the present system for the application of welding. Pre operational setups, control variables for welding process are used in the motion of the robot. Robots are considerably complicated electromechanical system with mutual interactions of robot mechanics and drives. The parametric studies are performed for the motion of the welding robot. The virtual prototype modelling and optimization of a 6 DOF robot developed using solid works, MATLAB and simmechanics.The voice control technology is implemented for controlling robot. This paper presents the kinematic solution in simmechanics and modelling of complex mechatronic systems. Using similar robot prototype and it is possible toget the optimized controller for the actual robot. Speech recognition system is used startingand appear in standard software applications. The present problem is integration of graphical user interfaces with speech process. A prototypemodel developed for studying integration of speech dialogue into graphical interfaces designed to programming of industrial robot arms in this paper. The aim of the prototype is to develop a speech dialogue system for solving simple relocation tasks in a robot work cell using ABB IRB 1410 industrial robot arm.

***Keywords:*** *RRR Robot, Welding, Voice Control, Speech, Simulation, XML, Mat lab.*

## I. INTRODUCTION

In recent scenario Voice recognition becomes the new technology forsimplifying the workers operating load of complex systems [1]. One of the important areas for application may be control of functions of robots used for manufacturing applications like pick and place, welding, inspection assembly, repair, maintenance when operators are serving in a supervisory capacity or the system is operating in a teleportation mode. Voice control sensors and variables will be of the operator's hands for their tasks, such as control of the manipulator direction of motion[2]. This paper emphasizes on the application of robotic welding using speech recognition. The system embedded with input sensor and controlling the robot manipulator motions and process constraints. The operator supervises the functions to the required motion. In this work commercially available Sphinx voice control software is being embedded with welding cell with robot. In present scenario tactile commands are used, but the voice recognition system may reduce the required response time. The operator system is the main criteria to be improved. If the operator is not within reach the exit button as a result a serious injury will be takes place. This can be eliminated by stopping the robot by issuing voice command could improve the operator's safety to enable him to stop the robot. Manual adjustments are required to locate in proper weld field. Voice recognition system eliminates the operator's hand with in the working area and work space envelop of the robot end effector. Also, operator fatigue should be minimized. Since the operator can continuously monitor the process during the input, then the effect of the change can be observed more quickly. Security is an important criterion for operation robot in industry. The Robot [Fig 1] should not be controlled by any unauthorised persons who enable misuse of the system. Multimodal interfaces and robot programming tools are shown in fig.2.

Fig 1: Welding robot

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# Influence of Token Similarity Measures for Semantic Textual Similarity

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***Abstract*— Semantic textual similarity measures the semantic equivalence between a pair of sentences. Lexical overlapping approach evaluates similarity among a sentence pair depending on the number of terms the sentence pair shares. The similarity can be measured at same level of abstraction or at multi levels. This paper presents the influence of token similarity measures using lexical overlap semantic similarity method in conjunction with quadratic assignment problem (QAP) alignment. Lexical overlap method is used to find whether a sentence pair is semantically equivalent or not.**

***Index Terms*—semantic textual similarity; lexical overlap; token similarity; QAP**

## I. Introduction

Finding the similarity among the sentences in natural language processing (NLP) plays a vital role because a sentence can be expressed in many forms without varying the sentence meaning. Therefore there is a need to identify the semantic similarity among the sentence pair. Measuring and recognizing semantic relation between the pair of sentence is the problem of semantic similarity [1]. The similarity can be measured at different levels of abstraction i.e., between words or sentences or paragraphs or documents and at multi levels such as word to sentence or sentence to paragraph etc.

STS methods are mainly based on computing similarity between sentence pairs. Extracting features from similarity metrics depends on word overlap and syntax similarity [2]. There are many issues to be addressed in finding the similarity at various levels depending on the corpus and the applications of text mining. In finding the sentence similarity, the similarity between the sentence pairs is performed to check whether both the sentences are equivalent or non-equivalent. For documents, the similarity between a document and all other documents to tell which document is more similar to the given document. The STS is used in many NLP applications such as Text Summarization, Question Answering, social network applications

## II. Related Work

Bar. et al.[3] has used the features extracted from string similarity metrics to complex vector space models. Saric et.al[2] extracted features from similarity metrics such as WordNet path metric, vector space metric, alignment metric, word overlap and syntactic similarity. Yeh and Agirre[4] proposed a method focusing on simple metrics. The semantic similarity metrics are based on ontology's, lexical matching, part of speech tagging. Han et al.[5] semantic similarity is dependent on two measures. First one is distributional similarity and the other one is WordNet Path similarity.

For measuring the semantic equivalence of sentences few metrics are proposed. Wong and Kit[6] measure the choice and order of words depending on surface methods, stemmed form of words, senses of word and semantic similarity among the words. METEOR[7] is based on matching the generalized concept of unigram. The alignments among words and phrases are based on exact token, stemmed form of words, synonym and paraphrase. Liu et al.[8] matches unigrams, bigrams and trigrams by taking into account recall, precision and F-measure and gave importance to recall.

Wu et al. [9] uses dependency trees to find the distance between paths. Castilo and Estrella[10] measure is dependent on similarity metrics retrieved from WordNet. Produces feature vectors for the language pairs.

## III. Lexical Overlap Approach

The methods to check whether a sentence pair is semantically equivalent or non-equivalent are dependency, latent semantic analysis (LSA) and lexical overlap. [11]In this paper the concentration is on lexical approach

When a sentence pair is given the semantic similarity of this pair is measured by computing the lexical overlap. The lexical overlap is measured depending on the number of terms they share in common. This method is also used in identifying the paraphrase. The Lexical overlap semantic similarity method

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# Role of ICT in Outcome Based Education

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***Abstract* – Outcome based education (OBE) focuses on abilities procured by the learners. It assists the progress of learners by creating abilities, impacting qualities, states of mind and determination and expanding expertise. Quality education which empowers the society can be achieved through information and communication Technologies (ICT) in teaching learning process to accomplish the concurred learners' level of ability. The rapid increase in student enrolment, knowledge explosion, advances in information and communication technologies (ICTs), globalisation, economic restructuring, and financial constraints have all contributed to reforms in higher education. ICT as an artifact facilitates information gathering, exchange and makes learning more easy and productive. It also offer students tools for knowledge construction, reflecting, sharing and collaboration in project work, while also connecting to communities, network and resources of their own interest. With globalization, there is a great need for higher education to provide a platform for gradual integration of its degrees with the best available in the world. The implementation of ICT in OBE can effectively accomplish the goals of quality education which is a process that reduces consumption of resources and increases learning outcomes. Quality can be ensured only if institutions can face competition to attract talented students, provide choices and innovate subject combinations. This paper demonstrates the role of ICT to restructure higher education to Outcome based model and its effective usage to improve quality and accessibility of education.**

**Keywords-** Curricula, ICT, Instructors, Learners, Outcome, OBE, Technology.

## I. INTRODUCTION

Education is a social job and its quality has conventionally connected with effective teachers having strong association with learners. Information and communication technologies (ICT) became essential elements in each and every activity of life. It has the capacity to enhance, expedite, enrich and develop abilities to inspire and activate learners. The role of ICTs in education includes the reception of general segments of information and communication technologies in teaching-learning process. It makes learning portrayed by a period slack between the conveyance of information by the teachers and receiving the information by learners. The different types of ICT products accessible and having pertinence to education are teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, audiocassettes, CD ROMs and so forth have been utilized for various purposes [1,2,3]. ICT facilitates the learners to study and accessible the materials of any subject from any part of the world at their convenient times. It promotes the flexibility for the learners to attend the classes without their physical presence daily to particular institution. It benefits teachers and learners not to reckon on the books or libraries or printed materials and also not to abash when the books get damaged or stolen or unavailable. The people in this competitive world are very much enthusiastic to update themselves with the new technologies from their work area only and now ICT provides the greater solution to the teachers to learn new things in their free time by well experts, researchers, professionals' lectures without travelling to different places for pursuing the technologies.

ICT yields beneficiary outcomes to teachers and students as follows:

1. Teachers can update their knowledge in and out of their curriculum.

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# In silico virtual screening of PubChem compounds against phosphotransacetylase, a putative drug target for Staphylococcus aureus

P. Bharath Siva Varma, Yesu Babu Adimulam and K. Subrahmanyam

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## Abstract

Reports on in silico based detection of putative drug candidates in the metabolic pathway of S. aureus resulted in non-homologous target genes with no close human analogue. Therefore, Phosphotransacetylase (PTA) was evaluated as promising drug target against S. aureus. An in silico virtual screening of PubChem compounds with enhanced binding energies when compared with reference ligand, acetyl phosphate (DB02897) was presented. 4E4R was selected as protein target and screening of 238 PubChem compounds with phosphotransacetylase was performed. Docking analysis resulted in binding energies ranging from −58.13 kcal/mol to −191.515 kcal/mol. Based on the interaction energies of ligands, top five compounds are reported and it was observed that compound 1 (ID: 10096390) displayed better inhibitory activities than the remaining. Interestingly, of all five compounds, except compound 1, all other molecules violated Lipinski rule and therefore, we report compound 1, with dock score −191.515 kcal/mol as the best inhibitor against phosphotransacetylase.

## Keywords

phosphotransacetylase, PTA, Staphylococcus aureus, docking analysis, MRSA, in silico virtual screening, PubChem compounds, drug targets, metabolic pathways, S aureus, binding energies, ligands, inhibitors

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Data Article

# MONO, DI and TRI SSRs data extraction & storage from 1403 virus genomes with next generation retrieval mechanism

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ABSTRACT

Now a day's SSRs occupy the dominant role in different areas of bio-informatics like new virus identification, DNA finger printing, paternity & maternity identification, disease identification, future disease expectations and possibilities etc., Due to their wide applications in various fields and their significance, SSRs have been the area of interest for many researchers. In the SSRs extraction, retrieval algorithms are used; if retrieval algorithms quality is improved then automatically SSRs extraction system will achieve the most relevant results. For this retrieval purpose in this paper a new retrieval mechanism is proposed which will extracted the MONO, DI and TRI patterns. To extract the MONO, DI and TRI patterns using proposed retrieval mechanism in this paper, DNA sequence of 1403 virus genome data sets are considered and different MONO, DI and TRI patterns are searched in the data genome sequence file. The proposed Next Generation Sequencing (NGS) retrieval mechanism extracted the MONO, DI and TRI patterns without missing anything. It is observed that the retrieval mechanism reduces the unnecessary comparisons. Finally the extracted SSRs provide the useful, single view and useful resource to researchers.

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# Improving Semantic Textual Similarity with Phrase Entity Alignment

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**Abstract:** Semantic Textual Similarity (STS) measures the degree of semantic equivalence between two segments of text, even though the similar context is expressed using different words. The textual segments are word phrases, sentences, paragraphs or documents. The similarity can be measured using lexical, syntactic and semantic information embedded in the sentences. The STS task in SemEval workshop is viewed as a regression problem, where real-valued output is clipped to the range 0-5 on a sentence pair. In this paper, empirical evaluations are carried using lexical, syntactic and semantic features on STS 2016 dataset. A new syntactic feature, Phrase Entity Alignment (PEA) is proposed. A phrase entity is a conceptual unit in a sentence with a subject or an object and its describing words. PEA aligns phrase entities present in the sentences based on their similarity scores. STS score is measured by combing the similarity scores of all aligned phrase entities. The impact of PEA on semantic textual equivalence is depicted using Pearson correlation between system generated scores and the human annotations. The proposed system attains a mean score of 0.7454 using random forest regression model. The results indicate that the system using the lexical, syntactic and semantic features together with PEA feature perform comparably better than existing systems.

**Keywords:** Semantic textual similarity, Lexical, Syntactic, Semantic, Regression models, Phrase entity alignment, Pearson correlation coefficient.

## 1. Introduction

Semantic Textual Similarity (STS) is one of the core disciplines in Natural Language Processing (NLP). STS assess the degree of semantic similarity between two textual segments. The textual segments are phrases, sentences, paragraphs or documents. The objective of the STS is to measure the degree of equivalence in the range 0 to 5 between a sentence pair where 0 indicates both the sentences are on irrelevant topics and 5 indicates both the sentences mean the same thing [1]. STS system is trying to emulate the idea of similarity degrees, thus replicating human language understanding.

STS is related to both Textual Entailment (TE) and Paraphrase (PARA). STS is different from both TE and PARA. STS measures the graded semantic similarity whereas TE and PARA measures whether both the sentences are equivalent or not. STS measures the bidirectional graded equivalence whereas the TE measures the directional equivalence between two text segments. In many NLP applications STS is appropriately applicable than TE and PARA.

There are three approaches for measuring STS namely alignment based, vector space and machine learning [2]. Alignment approaches computes the similarity between the words or phrases in a sentence pair and aligns the words or phrases that are most similar, and then take the quality or coverage of alignments as similarity measure [3]. Vector space approach is a traditional NLP feature engineering approach represents the sentence as bag-of-words, and the similarity is evaluated according to the occurrence of words or co-occurrence of words or other replacement words [4]. Machine learning approaches uses supervised machine learning models to combine heterogeneous features such as lexical, syntactic and semantic features of sentence pair [5].

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Original Article

## Bandwidth Enhanced Antipodal Vivaldi Antenna for Wide Band Communication Applications

G. V. Krishna[1*], B. T. P. Madhav[1] , M. V. Giridhar[1] , M. V. Reddiah Babu[1] , V. Sai Krishna[1] and S. S. Mohan Reddy[2]

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## ABSTRACT

**Objectives:** To design high bandwidth and high gain compact antipodal Vivaldi antenna which can be applied for modern communication systems especially for military communication systems. **Methods/Analysis:** Antipodal Vivaldi antenna is designed with flared elements on both sides of the substrate. Top side patch element is oriented towards left side and bottom side defected ground structured element is oriented towards right side. Finite element method based HFSS-15 is used in the design and simulation. The simulated EM-Results of the return loss, VSWR, radiation patterns and field distributions are analyzed and optimized antipodal vivaldi antenna is designed with parametric analysis. Fire resistance PCB substrate material with dielectric constant 4.4 is used as substrate to prototype the antenna model and measured

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# HIGH BANDWIDTH CIRCULARLY POLARIZED X-SLOT ANTENNA

**V. Sai Krishna, P. Pardhasaradhi, B. T. P. Madhav, M. V. Giridhar, M. V. Reddiah Babu, G. V. Krishna and S. S. Mohan Reddy***

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## Abstract

In this paper, a circularly polarized monopole antenna with L-shaped strip on the ground structure is presented for wideband applications. The proposed antenna has total dimension of $40 \times 40 \times 1.6\text{mm}^3$, designed on FR4 substrate with dielectric constant 4.4. A bandwidth of almost 14GHz and peak gain of 4.5dB are attained from the proposed antenna model. By using frequency selective surface beneath the antenna at an optimum distance, enhancement in the gain is achieved. An axial ratio less than 3dB conforms the circular polarization in the desired operating band.

## Introduction

To enhance the transmission quality of the wireless communication systems, one should concentrate on the data transfer rate and other related

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Keywords and phrases: circular polarization, axial ratio, bandwidth enhancement, L-shaped strip, X-slot, frequency selective surface.

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For the exchange of high rate information, wide band antennas are needed and their usage increased tremendously now a days. One of the major challenges in the design of Wideband antenna is the design of a small size antenna while providing wide bandwidth, omni-directional radiation pattern and stable gain. The proposed antenna consists of a monopole patch loaded with truncated L-shaped strip. The ground is extended vertically towards the two sides of the single radiator to improve the bandwidth. The size of the proposed antenna is 25 × 25 × 1.6 mm $^3$ and is prototyped on FR4 substrate whose permittivity is 4.4. The proposed antenna is providing wideband characteristics with suitable gain for wireless communication applications.

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# COMPACT FRACTAL MONOPOLE ANTENNA WITH DEFECTED GROUND STRUCTURE FOR WIDE BAND APPLICATIONS

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**ABSTRACT**

This letter presents a novel fan wing shaped uniform one dimensional fractal pattern antenna. The proposed antenna consisting of different inverted L-shaped elements to form a fan wing shaped structure. The design model achieved huge bandwidth characteristics with average gain of 4 dB. The simple structure of the proposed antenna with light weight makes it appropriate for many wireless communication applications. The simulated results on HFSS and measured results on ZNB 20 Vector Network Analyzer show that the proposed antenna has very good performance in impedance bandwidth and radiation pattern.

**Keywords:** *Compact, Fractal Monopole Antenna, Wide bandwidth, Defected Ground Structure (DGS) Wireless Communications.*

## 1. INTRODUCTION

Fractals are geometrically shaped, which are self similar, repeating themselves at different scales. At the beginning these mathematical shapes where treated only as abstract curios tics until 1900's. Then different branches of science discovered their practical applicability in different fields [1-5]. Soon after scientists discovered the practical of fractal geometric, research begin in the field of electro magnetics. This work produced successful devices for synthesis, modeling of microwave and mill metric waves. However, the main applications were for commercial telecommunications devices. These were compact antennas with properties such as broadband capability, frequency independent, small size and multi frequency operability. Other applications included fractal miniaturization of passive networks and components, fractal filters and resonators [6-10].

In the recent years, the geometrical properties of self similar and space filling nature has motivated antenna design engineers to adapt this geometry a viable alternative to meet the target of multi band operations [11-14]. In different papers microstrip fractal antennas has been studied with multi band characteristics. The fractal shapes are used to design multiband antennas, but some of them have potential wideband properties too. In order to enhance the bandwidth or reduce the size of the wide slot antennas, the fractal technique has been applied into wide slot radiators [15-16]. Fractal antenna is an emerging field that employs fractal concepts for developing new types of antennas with notable characteristics such as multiband, miniature, and high-directive elements. Due to their method of generation, some fractals possess unique feature such as self-similarity, which allows for multiband or wideband antenna designs. Among the known triple/multiband antenna prototypes, the planar monopole antenna with various structures has become a familiar candidate because of its attractive characteristics including low profile and weight, low cost, and versatile structure for exciting wide impedance bandwidth, dual- or multi resonance mode, and desirable radiation characteristics. However, the difficulty in designing antenna challenges engineers when the size of the antenna reduces and the number of operating frequency bands increases. So far, for size reduction, bandwidth enhancement, and resonance-

# A Comparative study of different signal processing techniques for Fault Location on Transmission Lines using hybrid Generalized Regression Neural Network

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***Abstract*—Travelling wave based fault location uses arrival times of the fault generated travelling waves at the terminals of the line. These arrival times are extracted by using different signal processing tools like Discrete wavelet transform (DWT), S-Transform (ST). The accuracy of fault location is highly influenced by the uncertainties in arrival time measurements. In this paper, an artificial neural network based fault locator is used to deal with such uncertainties. Based on the analysis of the arrival times estimated by different methods, a Generalized Regression Neural Network (GRNN) is trained for locating faults accurately. The performance of the compared technique is verified in MATLAB/Simulink environment by simulating different transmission line faults. Results obtained indicate the validity of Knowledge based solution using GRNN for fault location.**

***Keywords*— *Transmission line; Travelling waves; Wave Arrival times; Fault location; Generalised Regression Neural Network (GRNN).***

## I. INTRODUCTION

High voltage Transmission lines are used to transmit electric power to distant large load centres in power grids. These lines are exposed to faults which lead to mechanical damages and they must be repaired before returning the line into service. Therefore, Fast detection and location of faults is critical in maintaining reliability with the power system operation. Fault location methods are broadly classified into three categories as Phasor based methods, Travelling wave based techniques and Artificial intelligence techniques.

Many fault location algorithms have been developed over the years for locating the faults on two terminal lines. Synchronized voltage and current phasor measurements with a global positioning system (GPS) make it possible to locate faults accurately. If the measured signals are asynchronous, the phasor need to be synchronized accurately [1], [2]. In [3] fault location for double circuit line of two end system is developed using synchronized current phasors from multiple branches which are obtained from PMU's installed in the system. The usage of wavelet transform for analysing the power system fault transients in order to determine the fault location for two terminal transmission lines is described in [4]. Fault location for two terminal lines is done by using S-Transform based on travelling wave theory. This method extended for three terminal and multi-terminal networks is presented in [5]. In [6], fault location for two terminal lines is developed by using Park's Transformation. This method analyses the fault transients in order to determine the fault location and is extended to multi-terminal line. Reference [7] presents a fault location method for double circuit line using the Artificial Neural Networks (ANN) which utilizes the fundamental components of three phases current & voltage signals of both the circuits and is given as an input pattern to learn the hidden relationship. Best ANN Structures for Fault Location in locating a fault on transmission line is presented [8].

In this paper, a Generalised regression neural network based fault location algorithm is compared for two terminal lines using travelling wave theory. Existing fault location methods using travelling wave theory estimate the arrivals times using different transformation techniques like Wavelet transform, Park's transformation and S-Transform. These transform methods fail to correctly find arrival times and these uncertain times lead to poor accuracy in fault location. This percentage error with erroneous arrival times can be reduced by applying a neural network solution. In this paper, a GRNN is used for the fault location as it suits for such function approximation problems. The compared algorithm is tested for different fault conditions by varying fault type, fault inception angles, fault distance and fault resistance.

Section-II presents review on the existing fault location methods using travelling wave theory. Section-III describes the compared fault location method using Generalised Regression Neural Network (GRNN). Section-IV presents the simulation results and conclusions are given in Section-V.

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# A Fundamental Frequency Hybrid Control Technique Based Three Phase Cascaded Multilevel Inverter Topology

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***Abstract*—A three phase cascaded multilevel inverter topology and a hybrid control technique are presented in this paper. The topology is derived from a proposed module of addition and subtraction of sources (MASS). An attempt is made to optimize the component count, viz., power switches count, gate drive count, capacitor count, diode count and source count. The operating modes of basic module and the proposed three phase topology are explained. The analysis is presented for both symmetrical and asymmetrical configurations. The fundamental frequency hybrid control technique, which is derived from Nearest Level Control (NLC) and Switching Frequency Optimal (SFO) algorithms, is presented. The power semiconductor switches in the topology are driven by gating signals generated with hybrid SFO-NLC technique. The necessary comparisons are done to show the enhanced features with the view of optimized component count and power quality. The simulation results are carried out by MATLAB/SIMULINK software tool under both steady state and dynamic conditions. Experimental results are presented to validate the simulation results.**

***Index Terms*—Modular multilevel inverters, Nearest level control (NLC), Switching frequency optimal (SFO), Total harmonic distortion (THD).**

## I. Introduction

THE features of multilevel inverters (MLIs) have made them a superior candidate for the DC-AC power conversion [1]-[2]. The bias towards the distributed generation (DG) is getting increased recently. The renewable energy systems (RES) play a vital role in fulfilling the increased power demand. The power quality is one of the key parameter in this emerging area of power generation. The power quality is improved by adapting the MLI technology for DC-AC power conversion stage [3]. The three basic topologies used for RES are Cascaded H-bridge (CHB) [4], Neutral point clamped (NPC) [5]-[6] and Flying capacitor (FC) [7]. The CHB is fed with multiple sources, whereas the other aforementioned are of single source type. The single source topologies lack in modularity and have the tendency to increase the additional components viz., capacitor count, and diode count other than switching devices for higher level generation. The modular multilevel converters (MMCs) [8]-[9] are introduced for HVDC power transmission. The MMCs are associated with voltage balancing issues across DC-link capacitors, which are connected to a single source. The RES enabled the use of multiple source topologies like CHB, which are free from capacitor balancing issues. To enhance the efficiency by reducing the switching losses, many topologies with reduced switching device count are presented in [10].

The MLI configurations are classified as symmetrical or identical sources fed and asymmetrical or unequal sources fed. A three phase topology in symmetrical configuration is proposed in [11] for renewable energy applications. A three phase power cells topology with restructured CHB is presented in [12] to enhance the even distribution of power across the each power cell and modularity. The high frequency direct grid connected RES with MMCs are presented in [13]. A Three phase five level enhanced structure is reported in [14]-[15]. The hybrid three phase structures are proposed with improved control technique in [16]-[17]. A single DC source hybrid seven level three phase topology is presented in [18] with hybrid control technique to enhance efficiency. A three phase symmetrical topology with reduced component count is proposed in [19]. As asymmetrical configuration generates more level than symmetrical operating mode but the readily availability of DC sources of different magnitudes is a concern. So single phase topologies are proposed, which can work in both the configurations. An asymmetrical structure with lower source count is presented in [20]. These single structures can be extended to three phase operation. In [21] a three phase hybrid cascaded modular multilevel inverter (HCMMLI) is presented, which reduced the switch count, gate drive count compared with classical topologies.

In this paper, a three phase cascaded structure with optimum component count is presented. A simple fundamental

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# Application of data reconciliation for fault detection and isolation of in-core self-powered neutron detectors using iterative principal component test

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ABSTRACT

In-core neutron detectors are used in large nuclear reactors for the purpose of acquiring knowledge about the spatial flux distribution, which helps in control, monitoring and protection of the reactors. Random errors and faults, which cause degradations of the signals from the true values, invalidate the in-core detector measurement data. A scheme utilizing the analytical redundancy among physically redundant in-core detectors greatly facilitates removing the ill-effects of these errors. Particularly, data-based or process-history-based schemes are suitable when there are a large number of variables as in the case of in-core detectors. In this paper, application of a Data Reconciliation (DR) scheme (with the aim of minimizing the effect of random errors) coupled with a Fault Detection and Isolation (FDI) technique (which makes the data free from faults) to the in-core detector measurement data of the Advanced Heavy Water Reactor (AHWR) is presented. This reactor uses Vanadium Self-Powered Neutron Detectors (VSPNDs) as in-core neutron detectors. Since the constraint model developed for all the in-core neutron detectors as a whole cannot yield satisfactory performance from the DR and FDI, they are developed for the individual clusters of VSPNDs using the Iterative Principal Component Analysis (IPCA), a multi-variate statistical technique. The FDI technique used is the Iterative Principal Component Test (IPCT) discussed in Sagar et al. (2015c). The effectiveness of this scheme is tested as follows: (i) the mathematical model of the AHWR is used to simulate measurement data from VSPNDs; (ii) the data from VSPNDs are grouped as clusters based on correlations among the variables; and (iii) the effectiveness of the DR-based FDI of VSPNDs in some clusters is established based on some performance indices, when the spatial control of the reactor is active.

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## 1. Introduction

With the advent of improvements in automatic control, the duties of human operator in plants are subsided and in some cases, the human operator is removed. Hence, there is a strong need for the enhanced reliability of automatic control systems. Any fault (unpermitted deviations in the characteristic properties indicated by the measuring instruments) in the components of the system should be timely identified for increased availability of the plant and safety to the operating personnel and environment. In addition to the detection and diagnosis of occasional faults in the system components including measuring instruments (or detectors), reduction of random errors (always present) in the detector signals is also an important requirement since they increase uncertainty about the operating state of the plant. Generally, a supervision scheme performing Fault Detection and Isolation (FDI) is implemented alongwith the control systems. This scheme can be either model-based, signal-based or process data-based (Isermann, 2006). All the kinds of supervision schemes have their own merits and demerits. However, if the FDI is concerned only about the faults in detectors, a simple steady-state Data Reconciliation (DR) scheme (under process data-based schemes and posed first in (Kuehn and

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# Chloroplast genomics: Expanding resources for an evolutionary conserved miniature molecule with enigmatic applications☆

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ABSTRACT

Chloroplast, methylation depreived uniparental organelle genome is the most studied organelle genome from the perspective of evolution and functional omics. Recent advances in organelle genome sequencing both in terms of genome or transcriptome sequencing has opened a wide range of opportunities to understand the transcriptional and translational role of the genes mainly involved in the light harvesting apparatus and the evolution of the inverted repeats across the lineage. However, as compared to the nuclear genome, limited resources are available in case of organelle genome. In this review, we discuss the recent advances in the chloroplast genomics and the resources that have been developed for understanding the evolution, repeat patterns, functional genomics of this miniature molecule with enigmatic applications.

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## 1. Chloroplast genomes: dynamic organization and evolutionary fluctuations

Photosynthesis is critical to all aspects of plant life and to combat the environmental fluctuations. Chloroplast, evolutionary conserved and endoymbiotically originated molecule play a major role in photosynthesis by acting as host to three major complex such as photosystem II (PSII), the cytochrome b6f complex (Cytb6f), and photosystem I (PSI) [1]. Evolutionary conservation of these complexes in chloroplast genome thylakoid membrane represents the main sites of the light capture and the oxygen production as well as playing a major role in the light state transitions with plastid division apparatus responsible for the binary fission spatially distributed between the stromal and cytosolic space [2]. Among the spatially distributed genes in circular fashion, chloroplast represents a set of genes, which are vital for controlling the photosynthetic efficiency and to determine the dynamic organization of the thylakoid membrane and cyclic electron flow [3]. Evolutionary conserved organization of chloroplast genomes, which is circular in nature and follows a D-loop replication model is structured in a quadripartite structure, which is partitioned into two repeat regions, which are defined by the differences in the length as large single copy (LSC) regions spanning across a length of 80–90 kb and a short single copy region (SSC), representing a 16–27 kb region. Organization of these LSC and SSC regions is a dynamic process and has been widely reported to undergo expansion and contraction [4]. Although the evolutionary conservation of the chloroplast genic regions has been widely reported as exemplified by their use as molecular barcodes, few instances of rapidly evolving genes such as rbcL, which encodes the large subunit of ribulose-1,5-bisphosphate carboxylase/oxygenase (RUBISCO), and plays a major role in carbon assimilation and other genes such as matK (maturase K), ndhB and psbA-J, which are involved in modulating the state transitions has also been seen [5]. In contrast, the repeat organization is very dynamic and although conserved across the angiosperms, dynamic loss of the inverted repeat copies has been widely documented amongst the gymnosperms [6]. Taking all these structural variations with in the size of (150–160 kb), it worth to highlight the role of evolutionary conserved, distinct and model genome to understand the genome fluctuations (Fig. 1). From the view point of regulatory genomics, transcriptional and, transcriptional flux, chloroplast genomes have been widely explored in addition to point mutants and also the identification of the RNA Editing events.

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# FungREP 1.0: Online web-repository of microsatellite repeats from fungal genomes

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**Abstract**

Microsatellites are tandem repetitions of short DNA motifs found in genomes of all organisms. They have been significantly used in DNA fingerprinting, genome mapping, DNA forensics, linkage analysis, genetic disease studies, are known to be involved in gene regulation, bacterial adaptation, genome evolution and are extensively used as genetic markers. Microsatellites have been used as primers for genotyping of fungal strains, to study the evolution of fungal genomes as well as in the epidemiological studies of fungal pathogens. However, the distribution, frequency and abundance of microsatellites in several fungal genomes is not well studied. So, we have constructed an exclusive database of fungal microsatellites and a user-friendly web-interface to analyse the distribution and abundance of these repeats. FungREP currently hosts microsatellite data of 910 sequences of 44 different fungi that includes complete genome sequences, whole genome shotgun sequences and contigs. More than 10 million perfect and imperfect microsatellites and their corresponding information such as the repeat unit, position information, repeat statistics, protein information, etc., can be accessed from the first version of FungREP1.0. The database can be accessed for free from www.mcr.org.in/fungrep

**Keywords**

Database, Microsatellite, Fungus, Genome, Tandem Repeat, web-interface

## I. Introduction

Microsatellites, also called Short Tandem Repeats or Simple Sequence Repeats, are tandem repetitions of DNA motifs of size 1 to 6 bp [1]. Microsatellites are unique elements of DNA that are ubiquitous in nature and are found to be highly polymorphic [2]. The intensity of undergoing mutations in these microsatellite regions is at the rate of $10^{-6}$ to $10^{-2}$ per generation which is considered extra ordinary when compared to the mutation rate in normal DNA sequences ($10^{-12}$ to $10^{-10}$ per generation) [3][4]. The high mutation rates and the polymorphic nature of microsatellites favored them to be used as popular genetic markers and have been widely used in several areas including DNA fingerprinting, strain / species identification, DNA forensics, genome mapping, paternity and evolutionary studies [5]. Additionally, they are known to be responsible for causing certain genetic disorders and cancers, for bacterial / viral adaptation, gene regulation, etc. [6-10].

However, despite of their widespread usage and applications, microsatellites in fungi are not well studied. Few researchers earlier have attempted to analyze the distribution of microsatellites in fungal genomes but these studies are limited to a certain number of genomes and are not comprehensive [2] [11-13]. Microsatellites are widely used in genotyping of fungal strains and in epidemiological studies of various fungal pathogens in humans [14] [15].

The traditional method to develop microsatellite markers is to use laboratory experiments which are time consuming and cost intensive. With the arrival of high throughput sequencing techniques like NGS, the availability of genomic sequences has led to the development of low cost and effective *in silico* detection of microsatellites in genome sequences. Microsatellites can now be extracted easily using different repeat extraction software tools available and the corresponding repeat information can be compiled into a database. Several organism specific microsatellite databases have been developed earlier that include Mouse Microsatellite Data Base of Japan (MMDBJ) [16], Eukaryotic MicroSatellite Database (EuMicroSatdb) [17], Microsatellite Database for Prokaryotes (MICdb) [18][19], Viral Microsatellite Database (VMD) [20], Insect Microsatellite Database (InSatDb) [21], Silkworm Microsatellite Database (SilkSatDb), [22], Chloroplast and Mitochondrial SSR Database (ChloroMitoSSRDB) [23][24], and Fish Microsatellite Database (FishMicrosat) [25]. However, there is no exclusive database of Fungal Microsatellites in public domain which can serve as a valuable resource for researchers to analyze these repeats and to study their role further in various fungal species.

In this paper, we present the details of the first exclusive fungal microsatellite repeats database FungREP version 1.0 that hosts perfect as well as imperfect microsatellites extracted from different fungal genomes.

## 2. Microsatellite Extraction

The chromosome wise fungal genomes and other related sequences have been downloaded from the NCBI ftp site (ftp://ftp.ncbi.nlm.nih.gov/genomes/refseq/fungi/).

A total of 44 different species of fungi (900+ complete genomes / chromosomes / contig sequences) have been downloaded for constructing the initial version of



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# PRINCIPAL COMPONENT ANALYSIS BASED IMAGE DENOISING IMPLEMENTED USING LPG AND COMPARED TO WAVELET TRANSFORM TECHNIQUES

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## ABSTRACT

Removal of noise is an important step in the image restoration process, but denoising of image remains a challenging problem in recent research associate with image processing. Denoising is used to remove the noise from corrupted image, while retaining the edges and other detailed features as much as possible. This noise gets introduced during acquisition, transmission & reception and storage & retrieval processes. We propose an efficient image denoising technique using wavelet based principal component analysis(PCA) with local pixel grouping(LPG).For a better preservation of image local structures, a pixel and its nearest neighbors are modelled as a vector variable, whose training samples are selected from the local window by using block matching based LPG. This method compares PSNR (Peak signal to noise ratio) between original image and noisy image and PSNR between original image and denoised image. The MSE and PSNR of the proposed method and local adaptive wavelet image denoising method are compared and demonstrated. Therefore, the image after denoising has a better visual effect.

**KEYWORDS**: PCA, Denoising, LPG.

## INTRODUCTION

Information transmitted in the form of digital images is becoming a major method of communication in the modern age. An image is often corrupted by noise in its acquition and transmission. The received image needs processing before it can be used in applications. 'Image Denoising' involves the manipulation of the image data to produce a visually high quality image. Image denoising is used to remove the additive noise while retaining as much as possible the important signal features. In the recent years there has been a fair amount of research on wavelet thresholding and threshold selection for signal de-noising [1], [2],[3], [4], because wavelet provides an appropriate basis for separating noisy signal from the image signal. As a primary low-level image processing procedure, noise removal has been extensively studied and many denoising schemes have been proposed, from the earlier smoothing filters and frequency domain denoising methods [5] to the lately developed wavelet [1–10], curvelet [11] and ridgelet [6] based methods, sparse representation [7] and K-SVD [8] methods, shape-adaptive transform [15], bilateral filtering [10,11], non-local mean based methods [12,13] and non-local collaborative filtering [14].

Wavelet transform (WT) decomposes the input signal into multiple scales, which represent different time-frequency components of the original signal. At each scale thresholding [15,16] and statistical modeling [17-19], can be performed to suppress noise. The processed wavelet coefficients are transformed back into spatial domain by denoising. To represent the image wavelet transform uses a fixed wavelet basis with dilation and translation. Wavelet transform can cause distortion in the denoising output.

To overcome the drawback in wavelet transform, a spatially adaptive principal component analysis (PCA) is used which computes the locally fitted basis to transform the image and a shape-adaptive discrete cosine transform (DCT) to the neighborhood, which can achieve very sparse representation of the image leading to effective denoising. PCA is a useful statistical technique that has found application in fields such as face recognition and image compression,

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# Privacy Preserving Access Control to Incremental Data

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**Abstract:** Data privacy issues are gradually more becoming important for many applications. Usually, study in the database in the area of data safety can be mostly classified into access control research and data confidentiality research. There is little overlieamong these two areas. Access Control Mechanisms (ACM) safe the sensitive information from unauthorized users. Even sanctioned users may misuse the data to reveal the privacy of individuals to whom the data refers to. The privacy safety mechanism provides greater confidentiality for sensitive information to be shared. It is achieved by anonymization techniques. Privacy is achieved by the high accuracy and consistency of the user information, i.e., the precision of user information. In this paper, it offers confidentiality(privacy) preserving access manage mechanism for Incremental relational data. It uses the accuracy forced privacy protected access control mechanism for incremental relational database framework here. It uses the concept of imprecision bound related to access control mechanism for preserving privacy. The imprecision bound is set for all queries. For the privacy protection mechanism, it uses the combination of both the k-anonymity and fragmentation method.

**Keywords:** Identifier, Quasi-Identifiers, Access Control, Privacy, K-Anonymity, Imprecision Bound.

## I. INTRODUCTION

Organizations such as medical institutions, must release micro data (e.g., medical records) for experimentation and other purposes of public utility. However, sensitive personal information (such as the health status of a particular person) can be revealed in this process. These Organizations accumulate and analyze consumer data to modify their identities. Access Control Mechanisms (ACM) is wont to determine that only sanctioned information is usable to users. How sensitive data can be misused by sanctioned users compromising user privacy. The design preservation of privacy for sensitive data can accept the social control the privacy policies or safe against disclosure of identity by meeting certain items of privacy. [1] In this article, we question preservation of privacy to anonymity. The sensitive information, even after the abstraction to describe the attributes, is even able to involve attacks by sanctioned users. [2] This dilemma has been analyzed in depth in the place of issue of micro-data [3] and the definitions of privacy, for example, k-anonymity. [2]Other quasi-identifiers reveal privacy. The "linking attack" [4] must be managed to ensure the privacy of individuals. These link attacks can be managed by the anonymization of data in tables. Anonymity is the process of abstracting identity information by modify or processing of information. An innocent table is one that is made after the transmutation of data that does not distinguish between individual characteristics. There are various anonymization methods prevailing in keeping privacy. In this paper the work is about the privacy protected access control mechanism. It will provide the safety for the sensitive information. For an example, in the case of hospital management system there should be a number of patients. Some of the patients may have the disease which has to be isolated and so on. While publishing the patients‟ data to the state medical board for disease surveillance system, they should anonymize the personal data of the patient. For this purpose it can use the proposed method for the secured access control and privacy protection mechanism.

## II. RELATEDWORK

### A. Existing System

Existing methods only deals with any access manage mechanism or mechanism of privacy protection. There was no study of this type connected with the hybrid of both access control method and privacy protection method for relational data. Here it comes to the various methods used for the mechanism of access manage and privacy protection mechanism. In the case of privacy protection, the main technique is the k-anonymity method; k-anonymity has lately been explored as anmotivating approach to guard responsive data undergoing public or semi-public release from connecting attacks. To protect the identity of respondents when releasing micro-data, data subjects often eliminate or encrypt untie identifiers, such as names and social safety numbers. Re-identification data, however, grant no assurance of anonymity. Information released commonly It include other data, such as race, date of birth, gender and zip code that can be interrelated to information presented to the public to identify again

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# SECURE AUTOMATIVE LOCKING CONTROL AND ANTI THEFT USING GPS & BLUETOOTH

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**Abstract:** At present there is no innovative solution to unlock car doors and to provide car Anti-theft mechanism. We tried here to implement car door unlocking using Bluetooth technology and anti-theft system using GSM technology. This paper strives to achieve an efficient and inexpensive solution for scenarios like we may forget our car keys inside the car in which it was equipped with central locking system. This central locking system after certain period of time (which is pre-configured) the car doors will be automatically locked leaving keys inside the car. Whenever a car has been theft we register a complaint against it, though we know we can't find the car immediately. Our paper comprises of trending technologies such as android, blue tooth and GSM. We have developed a personal android application using with which the system is controlled. We implemented three level authentication mechanism in which only car owner can operate the system with his mobile. We came out with a solution for the above two mentioned problems.

**Keywords:** Arduino Uno, HC-05 Bluetooth Module, MAC Authentication, Android, GPSystem.

## Related Work:

The paper shows the function of controlling car doors using mobile Bluetooth Technology. This technology will help the user to access his/her car with an ease. The function was executed and implemented by using 89c2051 and 89s52 microcontroller. The function which was built, can be operated within the range of 10 meters from the vehicle through Mobile Bluetooth.[3] Many of us face difficulties in unlocking/ locking the car upon losing the car key. Moreover, if a car gets stolen and used for any illegal activities banned by the government then a car owner will face many legal issues. So to solve all these issues, an embedded system was designed and implemented in a real car that provides car security as well as additional features such as locking and unlocking of the car doors and turning ON and OFF the car engine using smart phone.[1] The paper shows an application which was implemented and developed for mobile phone to access car door locking system. This system was developed by integrating both hardware and software by using 'EmbededBlue' 506 Bluetooth technology. 'EmbededBlue' and Smart Phone were used as communication devices. The software was designed using the Dynamic C which was compiled and loaded into Rabbit Core Module. [2]

## Introduction:

In this work we designed hardware consisting of Arduino interfaced with Bluetooth module(HC-05) and GSM module .we used Arduino UNO board with Atmega microcontroller which controls the operations of system .We have used AT commands to configure and provide authentication and security with HC-05 module. The main reason why we used Bluetooth and GSM is because Bluetooth range is only for ten meters which is sufficient for car door unlocking whereas theft cannot be in sight hence we used GSM technology for anti-theft. We have implemented a novel idea for anti-theft system in which initially the vehicle engine will be shut down and the new location of the vehicle will be transmitted to the owner's mobile displaying the exact location of the vehicle on Google map in android application using GPS. Simultaneously a text message with location address will be sent to nearby police station. Now a day's everyone has a car and buying a car is a big dream and investment to people, they are thing about the advancement in the automobile industry. In behalf of that industries are concentrating to make vehicles to work in automated way. And making links with software industries to make automated systems. Because those system are integrated up with both software and hardware equipments. It can be developed for an easy access of unlocking and locking the car through mobile.

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# The Novel Pattern Classification over Performance Security Robustness Evaluation

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**Abstract:-**

Pattern classification is a branch of machine learning that focuses on recognition of patterns and regularities in data. In adversarial applications like biometric authentication, spam filtering, network intrusion detection the pattern classification systems are used. Our research paper consists of comprehensive study of spam detection algorithms under the category of content predicated filtering and rule predicated filtering. The implemented results have been benchmarked to analyze how accurately they have been relegated into their pristine categories of spam and ham. Further, an incipient filter has been suggested in the proposed work by the interfacing of rule predicated filtering followed by content predicated filtering for more efficient results. The system evaluates at design phase the security of pattern classifiers, namely, the performance degradation under potential attacks they may incur during operation. A framework is used for evaluation of classifier security that formalizes and generalizes the training and testing datasets. As this antagonistic situation is not considered by traditional configuration techniques, design transfer frameworks may show susceptibilities, whose abuse might astringently influence their execution, and subsequently restrain their commonsense utility. Extending example assignment hypothesis and configuration routines to antagonistic settings is subsequently a novel and exceptionally germane examination bearing, which has not yet been pursued in an efficient way.