

ABHINAV SINHA

PERSONAL INFORMATION

Born in India, 12 December 1992

emails sinha.abhinav@outlook.com
abhinav.sinha.cs@gmail.com
website <https://sites.google.com/view/sinha-abhinav>
phone (M) +91 7205824386

SHORT TERM GOAL

Looking for a career that utilizes my passion for engineering, my technical expertise; and offers advancements with a positive experience.

LONG TERM GOAL

To apply knowledge to the real time problems for betterment of science and society.

WORK EXPERIENCE

*Jun'17–
Present* Graduate student researcher

*Central Scientific
Instruments
Organization,
Council of
Scientific and
Industrial
Research, (CSIR-
CSIO), India*

The M. Tech programme of Mechatronics and Robotics, in which I am enrolled, is jointly offered by School of Mechatronics and Robotics, Indian Institute of Engineering Science and Technology, Shibpur, India and three CSIR labs- Central Scientific Instruments Organization, Chandigarh UT, India; Central Electronics Engineering Research Institute, Pilani, India; and Central Mechanical Engineering Research Institute, Durgapur, India. My coursework was completed in IEST-S during 2016-17 post which I am working towards coordinated control of multiple mobile robots for odor source localization at CSIR- CSIO. This project is a part of olfaction research at CSIR- CSIO.
Website: [CSIR](#), [CSIO](#)

Sep'14–Jul'16 Consultant, Automation & Control Systems

*TATA Consultancy
Services Limited*

Worked on tools like WinCC SCADA, Kepware, Step7, Prosoft, etc. for Control System Integration (CSI); GE IP Proficy Suite, SAP ME, etc. for Manufacturing Execution Systems (MES); and SAP MII for Enterprise Manufacturing Intelligence (EMI). Integrated data from factory floor machines with business layers for various productivity applications like reporting, dashboarding, monitoring, etc. Configured multi master and sensor data integration directly to cloud. Provided plant network security and segmentation for several new manufacturing units. Worked towards enhancing efficiency in Manufacturing Operations Management (MOM).
Website: [TCS](#)

Nov'15 Visiting faculty, EIS Talent Development

*TATA Consultancy
Services Limited-
Global Learning
Centre,
Trivandrum, India*

Visited TCS Global Learning Centre at Trivandrum, India to impart hands on training on Manufacturing Operations Management (MOM) and the role of web technologies such as HTML, CSS, JavaScript, etc. in it. The training subjects were of diverse background with a majority having a major in mechanical engineering. Introduced concepts of flow of data from factory floor to managerial layer and cloud; machine logic and business logic; and other aspects of role of engineering and IT in manufacturing.
Website: [TCS](#)

May-Jun'13 Engineering Intern

TATA Steel, India

Learnt how TATA Steel manages everything from science and technology to management, planning to execution and conception of idea to product development. My focus was on the applied study of functioning of one of the largest synchronous motors in Asia commissioned at TATA Steel which uses Siemens Sinamics drive system to operate, and triggers the blower which is connected to blast furnaces.

Website: [TATA Steel](#)

May-Jun'12

Vacation trainee and intern

*Bharat Sanchar
Nigam Limited,
India*

Learnt the functioning of telecom system and was able to do a thorough study of the functioning and behaviour of telecom system and exchanges and other networks. Theoretical courses covered transmission of signals and telecom operations, WiMax technologies, multimedia, internet and voice services, broadband, etc. The training also involved a field study of Base Transceiver Stations in the circle.

Website: [BSNL](#)

POSITIONS HELD

*Jul'14–
Present*

Reviewer, INDIAN CONTROL CONFERENCE — India

*IEEE CSS- Indian
Control Conference*

Responsibilities include reviewing research articles on systems and control theory, and applications for the prestigious Indian Control Conference in association with IEEE Control Systems Society at Indian Institutes of Technology.

Website: [Indian Control Conference](#)

Mar-Aug'16

Designated research reviewer on the technical program committee, 3RD INTERNATIONAL CONFERENCE ON ELECTRONIC DESIGN — Phuket, Thailand

IEEE

Being a research reviewer, my responsibilities included analysis of research work in various tracks in Control Systems, Mechatronics, Embedded Electronics, Robotics, and Nonlinear Circuits and Systems for the 2016 IEEE 3rd International Conference on Electronic Design (ICED 2016) at Phuket, Thailand.

Website: [ICED 2016](#)

Feb-Jul'16

Designated research reviewer on the technical program committee, IEEE 1ST INTERNATIONAL CONFERENCE ON POWER ELECTRONICS, INTELLIGENT CONTROL AND ENERGY SYSTEMS — New Delhi, India

IEEE

Being a research reviewer, my responsibilities included analysis of research work in various tracks in control and instrumentation for the 2016 IEEE 1st International Conference on Power Electronics, Intelligent Control and Energy Systems (IEEE ICPEICES 2016) at Delhi Technical University, New Delhi, India.

Website: [IEEE ICPEICES 2016](#)

*Sep'15–
Apr'16*

Reviewer, 2016 2ND ADVANCED RESEARCH IN MATERIAL SCIENCES, MANUFACTURING, MECHANICAL AND MECHATRONIC ENGINEERING TECHNOLOGY INTERNATIONAL CONFERENCE — Greater Jakarta, Indonesia

*Malaysia Technical
Scientist
Association*

My responsibilities included analysis of research work in mechatronics tracks for 2016 2nd Advanced Research in Material Sciences, Manufacturing, Mechanical and Mechatronic Engineering Technology International Conference.

Website: [MALTESAS CONFERENCE SERIES](#)

Sep-Dec'15

Reviewer, 1ST ENVIRONMENTAL AND CIVIL ENGINEERING TECHNOLOGY INTERNATIONAL CONFERENCE — Krabi, Thailand

My responsibilities included analysis of technical papers for 1st Environmental and Civil Engineering Technology International Conference (ENVICET).
Website: [ENVICET](#)

Mar-Dec'15 Reviewer & member of international technical program committee, 12TH IEEE INDIA INTERNATIONAL CONFERENCE ON ELECTRONICS, ENERGY, ENVIRONMENT, COMMUNICATION, COMPUTER AND CONTROL — New Delhi, India

IEEE

Being a research reviewer, my responsibilities included analysis of research work in various tracks in control, instrumentation, energy, power, electrical and electronics for the 12th IEEE India International Conference on Electronics, Energy, Environment, Communication, Computer and Control (E3-C3, IEEE INDICON 2015) at Jamia Millia Islamia, New Delhi, India.
Website: [IEEE INDICON](#)

Sep-Nov'15 Member of international technical program committee, 2015 IEEE INTERNATIONAL CONFERENCE ON SIGNAL PROCESSING & DATA MINING — Rome, Italy

IEEE

Responsibilities included reviewing papers on tracks of signal processing and control for 2015 IEEE International Conference on Signal Processing & Data Mining for inclusion in IEEEExplore and Journals of Elsevier.

Apr-Nov'15 Reviewer, MECHANICAL AND MANUFACTURING ENGINEERING CONFERENCE — Bandung, West Java, Indonesia

Responsibilities included reviewing papers on robotics and mechatronics track for 2015 Advancement on Mechanical and Manufacturing Engineering Technology Conference.
Website: [ADMMET](#)

May-Aug'15 Reviewer, IEEE 4TH INTERNATIONAL CONFERENCE ON ADVANCES IN COMPUTING, COMMUNICATIONS AND INFORMATICS — Aluva, Kochi, India

IEEE

Research reviewer for ICACCI Special Session on Multimedia Security and Forensics for IEEE 4th International Conference on Advances in Computing, Communications and Informatics.
Website: [ICACCI](#)

Jan-Aug'15 Reviewer, INTERNATIONAL CONFERENCE ON COMPUTING IN MECHANICAL ENGINEERING — Aluva, Kochi, India

Springer

My responsibilities included analysis of research work in control, robotics and mechatronics tracks for the Springer International Conference on Computing in Mechanical Engineering at SCMS, Aluva, Kochi, Kerala, India. The accepted papers are archived in Lecture Notes in Mechanical Engineering (ISSN: 2195-4356).
Website: [Lecture Notes in Mechanical Engineering \(ISSN: 2195-4356\)](#)

Oct'14-Aug'15 Reviewer, IEEE 4TH INTERNATIONAL CONFERENCE ON ADVANCES IN COMPUTING, COMMUNICATIONS AND INFORMATICS — Aluva, Kochi, India

IEEE

Research reviewer for IEEE 4th International Conference on Advances in Computing, Communications and Informatics.
Website: [ICACCI](#)

May-Jun'15 Member of Technical Programme Committee, 2015 GLOBAL SUMMIT ON COMPUTER AND INFORMATION TECHNOLOGY — Sousse, Tunisia

- IEEE* Served on the behalf of TPC for 2015 Global Summit on Computer and Information Technology.
Website: [GSCIT](#)
- May-Jun'15* Member of Technical Programme Committee,
2015 WORLD SYMPOSIUM ON MECHATRONICS ENGINEERING &
APPLIED PHYSICS — Sousse, Tunisia
- IEEE* Responsibilities included reviewing technical papers on mechatronics track for
2015 World Symposium on Mechatronics Engineering & Applied Physics,
Sousse, Tunisia.
Website: [WSMEAP](#)
- Feb-Jun'15* Reviewer, (MECHANICAL AND MANUFACTURING
ENGINEERING CONFERENCE — Bali, Indonesia
- Malaysia Technical
Scientist
Association* My responsibilities included analysis of research work in mecharonics tracks
for 2015 1st Advanced Research in Material Sciences, Manufacturing,
Mechanical and Mechatronic Engineering Technology International Conference.
Website: [MALTESAS CONFERENCE SERIES](#)
- Dec'14-
Mar'15* Member of international technical program
committee, 2015 INTERNATIONAL CONFERENCE ON ENGINEERING
AND COMPUTATIONAL INNOVATIVE SCIENCES — Casablanca,
Morocco
- IEEE* Being a member of the international technical programme committee, I
reviewed research papers on various tracks related to Computational Sciences
and Engineering for 2015 International Conference on Engineering and
Computational Innovative Sciences in association with IEEE.
- Sep'14-
Feb'15* Reviewer, IEEE 1ST INTERNATIONAL CONFERENCE
ON SIGNAL PROCESSING, INFORMATICS, COMMUNICATION AND
ENERGY SYSTEMS — Calicut, India
- IEEE* Being a research reviewer, my responsibilities included analysis of research
work in Signal Processing, Instrumentation and Control tracks for the IEEE 1st
International Conference on Signal Processing, Informatics, Communication
and Energy Systems (IEEE SPICES) at National Institute of Technology, Calicut,
Kerala, India.
Website: [IEEE SPICES](#)
- Aug'14-
Jan'15* Member of Technical Programme Committee,
2014 INTERNATIONAL CONFERENCE ON CONTROL AUTOMATION &
APPLIED MECHANICS — Algiers, Algeria
- IEEE* Being a member of the international technical programme committee, I
reviewed research papers on various tracks related to Control, Automation and
Applied Mechanics for 2014 International Conference on Control Automation &
Applied Mechanics in association with IEEE Algeria sub- section.
- Aug'14-
Jan'15* Member of Technical Programme Committee,
2014 INTERNATIONAL CONFERENCE ON COMPUTER APPLICATIONS
& AIDED DIAGNOSIS — Algiers, Algeria
- IEEE* Being a member of the international technical programme committee, I
reviewed research papers on various tracks for 2014 International Conference
on Computer Applications & Aided Diagnosis in association with IEEE Algeria
sub- section.

Aug'14- Jan'15 Member of Technical Programme Committee,
2014 INTERNATIONAL CONFERENCE ON COMPUTER VISION &
IMAGE ANALYSIS — Sousse, Tunisia

IEEE

Being a member of the international technical programme committee, I reviewed research papers on various tracks for 2014 International Conference on Computer Vision & Image Analysis in association with IEEE Tunisia section. Website: [ICCVIA](#)

Aug'13- May'14 Coordinator, KIIT ROBOTICS SOCIETY — KIIT
University, Bhubaneswar, India

KIIT Robotics
Society

Managed students directly by teaching and training them about innovation in technology and science related to robotics and embedded systems. Areas such as control, automation and signal processing being an integral part of the course. From theory to applications, hobbyist electronics to complex machines, there were several other major areas of engineering which were explored and a forum of discussion over the same was created. Apart from academics, there were other things such as event management, competitions that were regularly organized to promote interest and developments in robotics and embedded systems. Website: [KIIT University, KSAC](#)

Jun'11- May'14 Trainer, KIIT ROBOTICS SOCIETY — KIIT
University, Bhubaneswar, India

KIIT Robotics
Society

Indulged in teaching and training engineering students about innovation in robotics and embedded systems, particularly autonomous and semi autonomous robotics. Areas such as control of robotic systems, automation and signal processing being an integral part of the course. From theory to applications, hobbyist electronics to complex machines, there were several other major areas of engineering which were explored. Website: [KIIT University, KSAC](#)

Feb'14 Organizer, INGENIOUS TABLEAUX — KIIT
University, Bhubaneswar, India

KIIT Robotics
Society

Organized an autonomous robotic competition, Ingenious Tableaux. The theme of this event was to design an autonomous robot that can accomplish the task of line following combined with image processing. Website: [KIIT University, KSAC](#)

Feb'14 Organizer, PAPER PRESENTATION IN EMBEDDED
SYSTEMS — KIIT University, Bhubaneswar, India

KIIT Robotics
Society

Organized a paper presentation event. The theme of this event was to motivate young graduating engineers to participate and contribute to the inquiry of embedded systems. Technical papers, posters, ideas, working models, etc. were encouraged. Website: [KIIT University, KSAC](#)

Sep'13 Organizer, AUTONOMOUS ROBOTIC EVENTS —
KIIT University, Bhubaneswar, India

KIIT Robotics
Society

Organized several robotics events in which the design of autonomous or semi autonomous robots was covered followed by a small competition. The competition was open and witnessed a surge of participation from freshmen and sophomores in mechanical, electrical, electronics and computer science majors. The theme was to demonstrate the Dos and Dents in a robotic competition. Website: [KIIT University, KSAC](#)

Masters of Technology	<p>2016-2018 Indian Institute of Engineering Science & Technology, Shibpur, India</p> <p>GPA: 8.5 · Specialization: <i>Mechatronics & Robotics</i> · School: Mechatronics and Robotics</p> <p>Thesis: <i>Cooperative control of multiple mobile agents for locating source of odor (ongoing work)</i></p> <p>Description: This thesis explores the challenge of locating source of an odor via non bio inspired computing algorithms and a control systems point of view. With the obvious advantages of multiple robots over a single robot such as flexibility, robustness, scalability; this work focuses on the distributed coordinated control of multiple robots deployed in an environment to locate an odor source.</p> <p>Advisor: Dr. Amol BHONDEKAR</p>
Bachelor of Technology	<p>2010-2014 Kalinga Institute of Industrial Technology (KIIT University), India</p> <p>GPA: 8.48 · Major: <i>Electronics & Instrumentation engineering</i> · School: Electronics Engineering</p> <p>Thesis: <i>Automated PID tuning of line follower robot</i></p> <p>Description: This project report on automated PID tuning of line follower robots describes an effective way of controlling line following robots, i.e., a category of mobile robots via a simple yet effective control methodology based on classic Proportional-Integral-Derivative control. The conventional way of running, testing and implementing line follower robots is based on providing certain conditions to the robot in the form of a computer program and it has to move according to the conditions provided for different paths. However, this does not make the robot capable of taking decisions such as how to overcome the wobbling and to reduce the error that may creep in the form of deviation from the current position or say, overshoot from the line. To achieve the objective of enabling the robot to correct these moves on its own or to enable the robot to control and reduce the overshoot so as to stay on course, providing smoothness, we have implemented Proportional-Integral-Derivative control based on the informations that can be gathered from the movement of the robot.</p> <p>Advisor: Prof. Rajiv Kumar MISHRA</p>

PUBLICATIONS

Refereed Journals

IEEE	<p><i>under review</i></p> <p>Consensus tracking in multi agent system with nonlinear and non identical dynamics via event driven sliding modes, <i>under review, IEEE Transactions on Automatic Control</i>.</p> <p>Authors: Abhinav SINHA, Rajiv Kumar MISHRA</p>
Taylor & Francis	<p><i>under review</i></p> <p>Consensus in first order nonlinear heterogeneous multi agent system with event based sliding mode control, <i>under review, International Journal of Control</i>.</p> <p>Authors: Abhinav SINHA, Rajiv Kumar MISHRA</p>
Springer	<p><i>under review</i></p> <p>Consensus in second order heterogeneous multi agent systems using event triggered sliding mode control, <i>under review, Multidimensional Systems and Signal Processing</i>.</p> <p>Authors: Abhinav SINHA, Rajiv Kumar MISHRA</p>
Elsevier	<p><i>under review</i></p> <p>Control of a nonlinear continuous stirred tank reactor via event triggered</p>

sliding modes, *under review*, *Chemical Engineering Science*.

Authors: Abhinav SINHA, Rajiv Kumar MISHRA

under review

IEEE

Event driven sliding mode for congestion control in cognitive radio networks, *under review*, *IEEE Communication Letters*.

Authors: Tirtha MAJUMDER, Abhinav SINHA, Rajiv Kumar MISHRA, Sudhansu Sekhar SINGH, Prasanna Kumar SAHU

under review

Springer

Congestion control in Cognitive Radio Networks with event triggered sliding mode, *under review*, *Wireless Networks*.

Authors: Tirtha MAJUMDER, Rajiv Kumar MISHRA, Abhinav SINHA, Sudhansu Sekhar SINGH, Prasanna Kumar SAHU

January 2015

International
Journal of
Electronics and
Communication
Technology

Nonlinear autonomous altitude control of miniature helicopter UAV based on sliding mode methodology, *International Journal of Electronics and Communication Technology*, vol. 61, spl.- 1, Jan- Mar 2015, proceedings of International Conference on Foundatons and Frontiers in Computer, Communication and Electrical Engineering (C2E2 '15), Mankundu, India, 9th-10th January, 2015.

Authors: Abhinav SINHA, Rajiv Kumar MISHRA

Peer Reviewed Conference Proceedings

under review

IEEE

Temperature regulation in a Continuous Stirred Tank Reactor using event triggered sliding mode control, *under review*, *Indian Control Conference 2018*, *Indian Institute of Technology, Kanpur, India*, 4th-6th January, 2018.

Authors: Abhinav SINHA, Rajiv Kumar MISHRA

October 2015

IEEE

Robust nonlinear congestion controller for time delayed and uncertain cognitive radio based wireless network, 2015 IEEE Power, Communication and Information Technology Conference (PCITC), Bhubaneswar, India, 15th-17th October, 2015.

Authors: Tirtha MAJUMDER, Abhinav SINHA, Rajiv Kumar MISHRA, Sudhansu Sekhar SINGH, Prasanna Kumar SAHU

March 2015

IEEE

Sliding mode controller design for high performance of permanent magnet stepper motor, 2015 IEEE International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS), Coimbatore, India, 19th-20th March, 2015.

Authors: Abhinav SINHA, Rajiv Kumar MISHRA, Tirtha MAJUMDER

March 2015

IEEE

Robust altitude tracking of a miniature helicopter UAV based on sliding mode, 2015 IEEE International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS), Coimbatore, India, 19th-20th March, 2015.

Authors: Abhinav SINHA, Rajiv Kumar MISHRA

March 2015

IEEE

Robust nonlinear congestion controller for cognitive radio based wireless network, 2015 IEEE International Conference on Innovations in Information, Embedded and Communication Systems (ICIIECS), Coimbatore, India, 19th-20th March, 2015.

Authors: Tirtha MAJUMDER, Abhinav SINHA, Rajiv Kumar MISHRA, Sudhansu Sekhar SINGH, Prasanna Kumar SAHU

February

2015

IEEE

Robust and Smooth Nonlinear Control of an Industrial Robot for Automated Pick and Place, 2015 IEEE International Conference on Computing Communication Control and Automation (ICCUBEA), Pune, India, 26th-27th February, 2015.
Authors: Abhinav SINHA, Rajiv Kumar MISHRA, Supratik JAISWAL

January 2015

IEEE

Nonlinear Autonomous Control of a Two-Wheeled Inverted Pendulum Mobile Robot Based on Sliding Mode, 2015 IEEE International Conference on Computational Intelligence and Networks (CINE), Bhubaneswar, India, 12th-13th January, 2015.

Authors: Abhinav SINHA, Pikesh PRASOON, Prashant Kumar BHARADWAJ, Anuradha C. RANASINGHE

December

2014

IEEE

Perturbing effect compensation technique for smart sensors, 7th IEEE International Conference on Information and Automation for Sustainability (ICIAfS), Colombo, Sri Lanka, 22nd-24th December, 2014.

Authors: Anuradha C. RANASINGHE, Lahiru K. RASNAYAKE, Abhinav SINHA, Kavinda K. RASNAYAKE

December

2014

IEEE

Smooth sliding mode controller design for robotic arm, 2013 International Conference on Control, Automation, Robotics and Embedded Systems (CARE), Jabalpur, India, 16th-18th December, 2013.

Authors: Anuradha C. RANASINGHE, Lahiru K. RASNAYAKE, Abhinav SINHA, Kavinda K. RASNAYAKE

Book Chapters

January 2016

CRC Press/ Taylor
& Francis Group

Smooth sliding mode control of a nonlinear CSTR using an inverse hyperbolic function-based law, Foundations and Frontiers in Computer, Communication and Electrical Engineering: Proceedings of 3rd International Conference C2E2, Mankundu, West Bengal, India, 15th-16th January, 2016.

Authors: Abhinav SINHA, Rajiv Kumar MISHRA

January 2016

CRC Press/ Taylor
& Francis Group

Congestion control in Cognitive Radio Networks using fractional order rate reaching law based sliding modes, Foundations and Frontiers in Computer, Communication and Electrical Engineering: Proceedings of 3rd International Conference C2E2, Mankundu, West Bengal, India, 15th-16th January, 2016.

Authors: Tirtha MAJUMDER, Abhinav SINHA, Rajiv Kumar MISHRA, Sudhansu Sekhar SINGH, Prasanna Kumar SAHU

COMPUTER SKILLS

Basic

C++, JAVA, Javascript, VBscript, Microsoft .Net, MATHEMATICA, Xilinx ISE, ARM cortex microcontrollers, LabView, Adobe Photoshop

Intermediate

C, AVR microcontrollers, HTML, CSS

Advanced

MATLAB, L^AT_EX, Microsoft Office suite, Linux, Microsoft Windows family

AWARDS AND HONORS

Jul 2016

MHRD Postgraduate GATE fellowship · Ministry of Human Resource

Development, India

Awarded for qualifying Graduate Aptitude Test in Engineering (GATE) with 96 percentile, a computer based standardized test conducted by jointly by Indian Institute of Science and Indian Institutes of Technology on behalf of the National Co-ordination Board – GATE, Department of Higher Education, Ministry of Human Resource Development, Government of India for postgraduation education in engineering and graduate employments in various Public Sector Undertakings under Government of India.

<i>Dec 2015</i>	Champions of Initial Learning Program (ILP) · TATA Consultancy Services Limited Award for contribution towards Engineering and Industrial Services (EIS)-Talent Development in Manufacturing Operations Management domain. Associated with the position of visiting faculty at TCS.
<i>Jul 2015</i>	On the spot award · TATA Consultancy Services Limited Award for the research work done in the field of Control Systems and allied areas, and for serving as research reviewer for many technical peer reviewed conferences in India and abroad.
<i>Feb 2015</i>	Best paper award · IEEE Computer Society & IEEE Pune section Awarded Best Paper of the session track in Robotics at IEEE International Conference on Computing, Communication, Control and Automation, Pune, India
<i>Aug 2013</i>	Outstanding contribution award · KIIT Robotics Society, KIIT University Awarded for technical contribution towards the society.
<i>Mar 2012</i>	Top achiever award · National Institute of Technology Jamshedpur, India Awarded for achieving top score in the autonomous robotics event in Ojass 2012, an annual techno- management fest of NIT Jamshedpur, India.

OTHER INFORMATION

<i>Honorable Mentions</i>	2009 · Gold Medalist, Regional Mathematics Olympiad 2008 · Prefect & Head Boy, High School 2006 · Winner, Sanskrit couplets recitation competition 2004 · Prefect & Head Boy, Middle School 2004 · Winner of GK quiz competition 2003 · Featured in local newspaper as young scientific talent 2000 · Winner of calligraphy competition, Junior School
<i>Languages</i>	HINDI · Mother tongue ENGLISH · Full professional fluency ORIYA · Elementary proficiency BENGALI · Elementary proficiency MARATHI · Elementary proficiency
<i>Interests</i>	Travelling & Excursions · Fiction & Poetry

September 21, 2017