Akash Roy

Research Scholar | akashroy@usc.edu | +1 (323) 541-8060

Working on Micro Electromechanical Systems at the University of Southern California. Have two years of professional software development experience.

I. EDUCATIONAL QUALIFICATIONS

Postgraduate, University of Southern California | Jan 2021 – Present

Currently enrolled as a PhD candidate in the Electrical Engineering Department of the Viterbi School of Engineering. | **GPA - 3.85**

Undergraduate, Heritage Institute of Technology, Kolkata | Aug 2015 – May 2019

Was the Bronze medalist for ECE. Was the IEEE Student Chair for HITK Student Branch. | **GPA – 9.51 / 10**

South Point High School | April 2013 – March 2015

Passed Senior School Secondary Examination with 87%. Physics, Chemistry, Mathematics, Biology & English.

South Point High School | April 2000 – March 2013

Passed Secondary (Madhyamik) Examination with 88% aggregate.

II. WORK EXPERIENCE

Research Fellow, University of Southern California, Los Angeles, USA | Jan 2021 - Present

Working under Dr. Eun Sok Kim in his MEMS Research Group. Currently working on the following projects:

1. Developed an Algorithm for Lung Sound Classification to detect Wheezing using CNN which will be implemented on a chip for low power application.

2. Fabricating MEMS Resonant Microphone Array (RMA) and using LFRMA and HFRMA for implementing Active Noise Cancellation

Systems Engineer, Tata Consultancy Services Ltd, Kolkata, India | Jun 2019 – Dec 2020

Worked as a Full Stack developer using Angular 6 in the Frontend and Flask in the Backend. Was a part of the following projects for the client:

1. Developed Infrastructure Automation System to Automate On-Premises Server Patching and Disaster Recovery Systems.

2. Led Frontend Team for technology stack conversion from AngularJS to ReactJS as a part of tech stack upgrade process for the client.

3. Developed AWS Account Automation Portal for the client for smooth Account Creation and Management.

4. Developed User Portal for Scheduling Server Patching and Automated Server Patching Portals for On-Premises, AWS, and Azure Servers.

Frontend Development Intern, Tata Consultancy Services Ltd, Kolkata, India | Jan 2019 – Mar 2019

Developed a web portal where a user can draw pre-defined micro-services on a canvas and provide their interconnections and finally our application generates a state machine of the sequence and launches it to a new endpoint. Few important features of the project were:

1. Developed Microservice components for the project.

2. Developed a State Machine System from scratch with the microservices.

3. Generated an API Gateway Generator as the final product.

Electronics Educator, Unacademy, Bangalore, India | Apr 2018 – Aug 2018

Did an Internship at Unacademy, one of the leading Online Education Platforms in India to produce and record over 11 course modules with more than 140 videos in total. Few of the acclaimed course modules included:

1. Semiconductor Theory for Undergraduates

2. Digital Electronics for Undergraduates

3. Control Systems for Undergraduates

III. COURSE WORK

Graduate – Non-Linear Optics, Quantum Electronics

Undergraduate – VLSI Design, Control Systems, Digital Electronics, Solid State Devices

IV. RESEARCH INTERESTS

DEVICE SIMULATION	MOSFET, HEMT, MOS-HEMT, Junction less FET Design and Simulation
MICRO ELECTRO-MECHANICAL SYSTEMS	Acoustic MEMS, MEMS Microphones, MEMS Energy Harvester
MACHINE LEARNING	Deep Learning, Clustering and Classification Applications

V. TECHNICAL SKILLS

LANGUAGES	C, C++, Python, Angular, JavaScript, HTML, CSS
TECHNOLOGIES	TensorFlow, Git, Synopsys TCAD, Silvaco TCAD

VI. ACHIEVEMENTS

AWARDS	Outstanding Student Volunteer Award from IEEE Kolkata Section for 2019.
	Certificate of Appreciation from Rotary Club of our college as Outstanding Teacher for 2015-2016.
HONOURS	Offered PhD Admits from USC, Purdue University and PSU.
	Selected among top 30 students by Confederation of Indian Industries as a part of CII YUVA Mentorship program. [2017]
	Project Idea 'SUNCHARGERS' was selected among the top 3000 start-ups in India by Indian Institute of Management Calcutta Innovation Park. [2018]
	Judges Choice Award at Capgemini Global AI Hackathon. [2018]
	Selected among top 15 teams across India as the finalists of Sankalp Semiconductors Solar Energy Hackathon. [2019]

VII. PROFESSIONAL ACTIVITIES

1. Serving as Graduate Chair at IEEE USC Student Branch. [2021-Present]
2. Served as the Chairman of the IEEE Student Branch of Heritage Institute of Technology. [2017-2018]
3. Coordinator at 'Flying Club' of Heritage Institute of Technology. [2018-2019]
4. Convenor of 'Lord of the Tracks' organized by the IEEE EDS HITK Student Chapter. [2018]
5. Mentored over 50 school children of grades 7 and 8 teaching them basics of Autonomous Robotics.

VIII. PUBLICATIONS

1. Roy, Akash, Rajrup Mitra, Arnab Mondal, and Atanu Kundu. "Analog/RF and Power Performance Analysis of an Underlap DG AlGaN/GaN Based High-K Dielectric MOS-HEMT." Silicon (2021): 1-8.

2. Roy, Akash, Rajrup Mitra, and Atanu Kundu. "Influence of Channel Thickness on Analog and RF Performance Enhancement of an Underlap DG AlGaN/GaN based MOS-HEMT Device." In *2019 Devices for Integrated Circuit (DevIC)*, pp. 186-190. IEEE, 2019.

3. Mondal, Arnab, Akash Roy, Rajrup Mitra, and Atanu Kundu. "Comparative Study of Variations in Gate Oxide Material of a Novel Underlap DG MOS-HEMT for Analog/RF and High-Power Applications." Silicon 12, no. 9 (2020): 2251-2257.

4. Mitra, Rajrup, Akash Roy, Arnab Mondal, and Atanu Kundu. "Influence of Symmetric Underlap on Analog, RF and Power Applications for DG AlGaN/GaN MOS-HEMT." Silicon (2021): 1-8.

5. Mitra, Rajrup, Akash Roy, Atanu Kundu, and Mousiki Kar. "Impact of AlGaN Doping Concentration on the Analog/RF Performance of a Double Gate Underlap n-AlGaN/GaN MOSHEMT." In 2020 International Symposium on Devices, Circuits and Systems (ISDCS), pp. 1-4. IEEE, 2020.

6. Mondal, Anindita, Sneha Ghosh, Akash Roy, Mousiki Kar, and Atanu Kundu. "Effect of Doped AlGaN Width Variation on Analog Performance of Dual Gate Underlap MOS-HEMT." In 2020 IEEE Calcutta Conference (CALCON), pp. 244-247. IEEE, 2020.

IX. CO-CURRICULAR ACTIVITIES

1. Head of Technical Team for the Technical Festival of Heritage Institute of Technology for 2019.

2. Organizing Committee member for Cultural Festival of Heritage Institute of Technology for 2019.

3. Extern at TATA Consultancy Services Limited for developing a chatbot for one month in 2018.

4. Trainee at Electronic Centre of Excellence at Bhubaneshwar, India for one month in 2018.

5. Vocational Trainee at Airports Authority of India, Kolkata for one month in 2017.

6. Prefect at South Point High School for 2013-2014.

X. RELEVANT LINKS & REFERENCES

Current Research Group: https://mems.usc.edu/

Personal Website: https://akashroy.com/

Google Scholar: https://scholar.google.com/citations?user=Cwtbaz4AAAAJ

LinkedIn: https://www.linkedin.com/in/aroy97/

Contact:

1. Dr Eun Sok Kim (PhD Mentor) at **eskim@usc.edu**.
2. Dr. Atanu Kundu (Undergraduate Research Guide) at **kundu.atanu@gmail.com**.
3. Dr. Mousiki Kar (Chair, IEEE EDS Kolkata) at **mousikikar@gmail.com**.