Khush Gohel

BITS Pilani Hyderabad Campus
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Education

BITS Pilani Hyderabad Campus **Aug 17 - Aug 21**
Bachelor of Engineering in Electrical and Electronics *CGPA: 8.04/10*

Research Experience

MEMS Microfluidics and Nanoelectronics Lab **Jun 21 - Jul 21**
Research Assistant (Supervisor: Prof. Sanket Goel) *Hyderabad, India*

- **Laser Induced Graphene (LIG) Devices**
  - Optimized laser ablation parameters to obtain LIG on Polyimide and paper substrate for its utilization for strain sensing and supercapacitor applications.
  - Studied charge storing mechanisms in super-capacitors and its relation with LIG electrode morphology via electro-chemical characterizations.
  - Fabricated LIG strain sensor by using clean-room free fabrication techiniques and investigated LIG sensing mechanism based on its morphology and electrical characteristics.

Flexible and Wearable Nanoelectronic Devices Research Group **Aug 19 - May 20, Jan 21 - May 21**
Undergraduate Student Researcher (Supervisor: Dr. Parikshit Sahatiya) *Hyderabad, India*

- **Novel hybrid 2D nanomaterial memristor**
  - Utilized 2D materials Transition Metal Chalcogenide SnS and Mxene Ti3C2 as active materials synthesised by facile single step solvothermal and MAX phase etching method respectively.
  - Performed Electrode and active material deposition using thermal evaporation and spin coating, respectively, to successfully build a unique SnS/MXene memristor.
  - Studied numerous existing memristor models to delineate the observed memristive behaviour for the hybrid memristor.
- **Micropatterned Transient humidity and pressure sensor**
  - Fabricated flexible pressure and humidity sensor using MoS2 Quantum Dots (QDs) and Poly Vinyl Alcohol (PVA) showing water triggered transiency of 180 seconds.
  - Micro-patterned the device surface using CO2 laser etched PDMS mould to improve the sensor sensitivity.
  - Researched on QD/polymer structures and Quantum effects like coulomb blockade, and Energy band bending to provide conduction mechanism inside the sensor.
- **Low-Cost Eraser based Multifunctional sensor**
  - Fabricated a fully functional flexible and biodegradable multi-functional (breath and strain) sensor using clean-room free fabrication techniques.
  - Synthesized 2D nanomaterial MoS2 a Transition Metal Dichalcogenide(TMD) by two-step hydro-thermal synthesis on an eraser substrate and utilized it for simultaneous strain and breath sensing.
  - Analysed strain & breath sensing characteristic of the fabricated device, and learned XPS, SEM, TEM and X-Ray Diffraction analysis techniques.

Publications

[1] **A Water-Soluble Micropatterned MoS2QDs/PVA Film as a Transient Contact (Pressure) and Non-Contact (Humidity) as Touch and Proximity Sensor**
N. Bokka, **K. Gohel**, P. Sahatiya
Presented at IEEE 21th International Conference on Nanotechnology (IEEE-NANO21)
Accepted in Journal of Applied Polymer Science (Wiley), doi: 10.1002/app.51711

[2] **MoS2 based Multifunctional sensor for both Chemical and Physical Stimuli and their Classification using Machine Learning Algorithms**
V. Selamneni*, **K. Gohel***, N. Bokka, S. Sharma, P. Sahatiya (*first author with equal contribution)
Accepted in IEEE Sensors, doi: 10.1109/JSEN.2020.3023309

[3] **Graphenized papertronic devices using Blue laser ablated Polyimide resin**
S. Pavar, **K. Gohel**, S. Goel
Accepted in IEEE Nanotechnology Materials and Devices Conference 2021

[4] **Demonstration of a 2D SnS/MXene Asymmetric Nanohybrid Memristor**
S. Saha, V. Adepu, **K. Gohel**, P. Sahatiya, S. Dan
Poster Presentation in International Workshop on the Physics of Semiconductor Devices (IWPSD 2021)

Projects

- **8-bit Pipelined Processor Design based on RISC V architecture:** Simulated a 4 stage pipelined processor with Instruction fetch Unit, Register file, Execution unit(ALU) and Write back stage along with Data hazard detection and forwarding unit to overcome data hazard for Add, jump, and mov instructions.
- **Wireless UART Communication between FPGA and Mobile:** As a part of Bachelor's course group project for the course FPGA Laboratory, UART communication protocol was implemented on the Zedboard Zynq-7000 (FPGA) connected to bluetooth module HC-05 which is wirelessly communicating with a mobile application.
- **Implementation of DCM DC-DC Converters for piezoelectric harvestors based on research papers:** As a part of Bachelor's course group project for the course Power Electronics, Springer paper "DCM Boost Converter in CPM Operation for Tuning Piezoelectric Energy Harvesters" was taken as reference for simulation in the MATLAB Simulink.
- **Implementing Microelectronic sensors using different fabrication techniques:** AutoCAD Fusion 360 was used to design the 3D model and fabrication techniques like 3D Printing, Soft Lithography and Stereo-lithography were incorporated to fabricate an LCR Resonator for wireless milk adulteration detection.

Work Experience

Intel - Data Center Group(DCG) **Oct 21 - Present**

System Validation Engineer (Grade-3) *Bengaluru, India*

- Primarily working on pre-silicon and post-silicon validation of Intel's Xeon processors memory subsystem.
- Enabling workloads and test cases to perform stress test on the Server Platform memory modules while ensuring maximum coverage and to resolve critical bugs related to the processor architecture.

JustAct (DSNL) **Aug 20 - Dec 20**

Intern, Front-end Web Developer *Chennai, India*

- Used React JS for frontend. Work included fixing UI issues, developing pages, incorporating new features, and testing.
- Worked as an only developer from the company's side along with the CTO to co-ordinate with the outsourced team.
- Developed essential skills sets like adaptability, communication, coordination and time management.

Finnacle Investment Academy **May 19 - Jul 19**

Content Development Intern *Surat, India*

- Performed research on the World economy i.e., individual country's financial market, and its contribution to World Economy, Money and its origin, Rise and fall of various civilizations and nations.

Relevant Coursework

- Thin Film Technology
- Micro Electro Mechanical Systems
- Electronic Devices
- Bio And Chemical Sensors
- Micro-Electronic Circuits
- NanoTech Maker's course

Technical Skills

- **Fabrication techniques known:** Photolithography, Thermal Evaporation, 3D Printing, Direct UV Laser writing, CO2 Laser engraving, Softlithography, Spin Coating, Etching
- **Softwares:** Origin, Xilinx ISE, LT Spice, Vivado, Simulink, Fusion 360, AutoCAD, COMSOL, Adobe (Illustrator, Photoshop, Premiere Pro, Aftereffects)
- **Programming languages:** C/C++, Python, System Verilog, Verilog, x86 Assembly language, Javascript, CSS, React JS, HTML
- **Characterization Skills:** Optical Microscopy, FESEM, UV-Visible Spectroscopy, PL spectroscopy, Impact and Tensile Testing, Cyclic Voltammetry, Galvanostatic Charge Discharge

Position of Responsibility

VFx Club **Jul'18 - May'19**

Joint Secratary *Hyderabad, India*

- Managed multiple VFx Club events at the BITS Hyderabad cultural festival Pearl 2019, which drew over 40 participants. Conducted workshops on camera handling and video editing software with over 120 students in participation.

Activities

- **Extra-curricular:** Actively participating in helping underprivileged by distributing food and other items especially during the pandemic. Performing guitar covers to post content of YouTube and Instagram.
- **Hobbies and Interest:** Videography, Video editing, Photography, Guitar Playing, Travelling, Chess
- **Languages known** English, Hindi, Gujarati