Swapnil More

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EDUCATION

Ph.D. (Nanotechnology)
IISc Bangalore
GPA: 7/10
Expected in Dec 2020

Masters (Nanotechnology)
IISc Bangalore
GPA: 6.4/8
June - 2016

BE (Mechanical)
University of Pune
Grade: 69.31 % (Distinction)
June – 2012

EXPERTISE

Data Wrangling
Pandas, NumPy, SQLalchemy, Matplotlib, D3.js, Chart.js

Machine Learning
TensorFlow, Scikit-learn, DNN, CNN

Web Development
RESP API design, Dashboard for IoT, Python-Flask

Programming
Python, JavaScript, MATLAB, LabVIEW, Mathematica

Nanotechnology
E-beam Lithography, RIE, DRIE, SEM, AFM

Design Tools
CATIA, AutoCAD,

FE solvers
COMSOL, ANSYS

CERTIFICATION

Machine Learning
(Stanford Online)

EXPERIENCE

Research Scholar

NEMS Lab, Centre for Nano Science and Engineering, IISc Bangalore.
Aug 2015 – Present

Project: Nonlinear dynamics and strain engineering of 2D nanoelectromechanical systems (NEMS).

- Design and implement nano-fabrication processes for NEMS.
- Setup experimental apparatus to actuate and detect resonance in NEMS using Signal Generators, Lock-In amplifiers, Spectrum Analyzers; design experiments for specific testing; designing PCB and RF circuits for custom needs.
- Analyzing data from scientific experiments to extract dynamical behavior of the system;
- Modeling nonlinear behavior of NEMS.
- Writing application software for instrument control, data acquisition and data analysis (Python, JavaScript, Matlab).

Senior Project Assistant

IIT Bombay.
July 2013 – Nov 2013

- Logistics and administrative requirements of the project.

Graduate Engineer trainee

Mahindra Navistar Automotive Ltd.
Aug 2012 – Jan 2013

- Conducting market surveys to understand customer requirements in the LCV segment.
- Organizing customer and financial service providers for boosting product sales.
- Developing sales executive skills by designing product manuals and sales checklists.

CONFERENCES

- More S., Naik A. (2019) Fabrication of 2D NEMS on Flexible Substrates for Strain Engineering in Sensing Applications. The Physics of Semiconductor Devices. IWPSD 2017. Springer Proceedings in Physics, vol 215. Springer, Cham.
- More S., Naik A. Modelling Internal Resonance in 2D NEMS, International Conference on Nonlinear Solid Mechanics (ICoNSOM), Rome, Italy (June 16-19, 2019).
- More S., Naik A. Manipulating Internal Resonance and Coupled Modes in NEMS, NMC 2019 , Lausanne.

Projects Finished

Computer Science

Web app for Scientific Experiments
Python library for instrument control using PyVisa and VXI11
Flask server for remote control of scientific experiments
Dashboard to monitor the experiment results

Modelling Nonlinear Dynamics of NEMS with tunable nonlinearities.
Developed a numerical integration scheme to solve for the temporal response of the nonlinear dynamical system. The temporal solution was utilized to generate the frequency domain response of the system. The simulations allowed evaluating the behavior of a highly nonlinear system in multi-parameter space.

Microscope Automation
Built Arduino controlled motorized X-Y stage for a microscope. Developed scripts to automate scanning of test surface under microscope, process and analyze scan images for desired features and return the X-Y coordinates of detected features on the test surface

Nanotechnology

Design of PCB with vacuum cavity for actuation and detection of resonance in 2D NEMS fabricated on thin Silicon Diaphragm which can be deformed by applying air pressure for strain tuning of the NEMS

Fabrication of NEMS on flexible PET substrate for strain engineering.
Study of electronic properties and gas sensing behavior of mono, bi, tri-layer MoS2 under application of uniaxial strain.

Preparation of fabrication run-sheet for vertically aligned micro channels in silicon wafer.

Mechanical Engineering

Development of TE mode cell for measurement of electromagnetic emissions and testing radiation immunity of integrated circuits.

Design of six-speed reduction gearbox for tool room lathe of 406 x 762 mm capacity.
Design of a single plate clutch for automotive application.

Pneumatic automation using programmable logic controller (PLC).

Skills Learned

IoT
Python: NumPy, Pandas, Flask, REST API design
JavaScript, D3.js, Chart.js

SciPy
Numerical Methods

Computer Vision
Matlab

PCB Design (Eagle)
Vacuume system design

E-beam Lithography
RIE, DRIE
SEM, AFM

CMOS Wet Bench Processing

Testing DUTs for electromagnetic campatibility

CAD
Machine Design

Pneumatic Actuator Design
PLC