Dimple Kochar

Electrical Engineering

Indian Institute of Technology, Bombay

Specialization: Microelectronics and VLSI

16D070010

Dual Degree (B.Tech. + M.Tech.)

Gender: Female

DOB: 01-02-1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	

SCHOLASTIC ACHIEVEMENTS

- Completed a **Minor** Degree in **Computer Science and Engineering** *[2017-19]*
- Conferred the Desai-Sethi Scholarship, which is awarded to the **top 5** girls admitted to IIT Bombay *[2017-19]*
- Stood **first** in Maharashtra among girls with AIR **102** in **JEE Mains** and AIR **295** in **JEE Advanced** *[2016]*

RESEARCH PROJECTS

- **Dipole-Exchange Spin Waves in Ferromagnetic Films** - *Applied Physics* *[May '19 - Jul '19]*
  Advisor: Prof. Gerrit Bauer, Kavli Institute of Nanoscience *TU Delft, Netherlands*
  - ◇ Calculated the chirality, **wave function**, magnetization & dipolar field profiles for various **magnon** modes
  - ◇ Solved Landau–Lifshitz & Maxwells' equations to obtain the **dispersion** relation for a given film thickness

- **Failure Time Estimation of SRAM due to RTN** - *Circuits & CAD* *[Jan '19 - Present]*
  Advisor: Prof. Animesh Kumar, Electrical Engineering Department *IIT Bombay*
  - ◇ Acquired time to failure distribution of a stored bit in an **SRAM** cell due to **single trap** Random Telegraph Noise (RTN) model by composition of **Monte-Carlo** simulations & circuit-level abstraction of an SRAM cell
  - ◇ Showcased results of this procedure on **45 nm** technology at various supply voltages using Cadence

- **Modelling of MOS Device Reliability** - *Device Physics* *[May '18 - Present]*
  Advisor: Prof. Souvik Mahapatra, Electrical Engineering Department *IIT Bombay*
  - ◇ Designed a cell based **oxide percolation** model which creates bulk & interface traps with distinct rates
  - ◇ Utilized **WKB** tunneling to model **SILC** measurements of **dual oxide** wafers made using different processes
  - ◇ Extracted **bulk trap** densities in wafers & used a **Reaction-Diffusion** (RD) framework to model them

KEY COURSE PROJECTS

- **4×4 Butler Matrix Circuit** - *Microwave Integrated Circuits* *[Sep '19 - Nov '19]*
  - ◇ Constructed the circuit with **90°** **hybrids** and **phase delay** lines for operation at a frequency of **5.4 GHz**
  - ◇ Fabricated on FR4 substrate using microstrip transmission lines and obtained **equal power division**

- **Layout and Back-extracted 16 bit Brent Kung Adder** - *VLSI Design* *[Sep '19 - Nov '19]*
  - ◇ Designed the schematic & layout passing **DRC** & **LVS**, and did parasitic extraction of each module of adder
  - ◇ Combined the modules & conducted **post layout** simulation tests and achieved accurate adder functionality

- **Power Amplifier Design** - *Solid State Microwave Devices* *[Jan '19 - Apr '19]*
  - ◇ Fabricated a power amplifier of gain **2.5 dB** at **520 MHz** with S_{11} & S_{12} values of -18 dB & -35 dB respectively
  - ◇ Designed **matching networks** for the amplifier IC AFIC901N using microstrip transmission lines in ADS

- **Pipelined RISC Microprocessor** - *Microprocessors* *[Jul '18 - Nov '18]*
  - ◇ Devised an **8**-register, **16-bit** computer system with **6 stage pipelines** capable of executing **15** instructions
  - ◇ Equipped it with control flow, data forwarding & **hazard mitigation**, & tested the design on **DE0-Nano FPGA**

- **Music Genre Identification** - *Machine Learning* *[Feb '18 - May '18]*
  - ◇ Implemented various Machine Learning algorithms like **Principal Component Analysis**, **Neural Networks** and **Random Forests**, and utilized **Bayesian Optimization** for hyperparameter tuning
  - ◇ Achieved an accuracy of **56%** and an F1 score of **50.65%** utilizing the Random Forest algorithm

POSITIONS OF RESPONSIBILITY

- **Academic Mentor** - *Department Academic Mentorship Programme, IIT Bombay* *[Apr '19 - Present]*
  - ◇ Selected through extensive **peer reviews** & interviews, to help academically weak & ARP students improve
  - ◇ Responsible for mentoring **11** students and playing a key role in their overall development

- **Editor, Insight** - *Official Student Print Media Body, IIT Bombay* *[Apr '18 - Mar '19]*
  - ◇ Recipient of **Institute Journalism Special Mention Award** bestowed for outstanding contribution to the field
  - ◇ Part of the **22** member team managing Insight's newsletter, with an online readership of over **0.4 million**

- **Teaching Assistant** - *IIT Bombay*
  - ◇ Probability and Random Processes - *Department of Electrical Engineering* *[Aug '20 - Present]*
  - ◇ Differential Equations - *Department of Mathematics* *[Mar '18 - Apr '18]*
  - ◇ Quantum Physics and Applications - *Department of Physics* *[Jul '17 - Nov '17]*

Scholastic achievements and extracurricular activities are not verified by the Placement Cell