# RAKSHIT MITTAL

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## Formal Education

*Pursuing* **MSc. Mathematics & B.E.(Hons) Electronics and Instrumentation** (present)
**CGPA – 7.37/10** at the end of 7/10 semesters. (dual-degree program)
Birla Institute of Technology and Science Pilani, Goa Campus, India.
Merit Scholarship [Year 2], Technical Support Fund [2021], BITSAA Research Scholarship [2021]

*Graduated* secondary school (CBSE) with **94.4% marks.** (2017)
B.K. Birla Centre for Education, Pune. (Co-Ed, Residential, IPSC, NPSC)
Subjects: Physics, Chemistry, Mathematics, English, Informatics Practices.

**Testing:**

- SAT II {Math Level II}: **800/800** & {Physics}: **790/800** (03/12/16)
- SAT I: **1480/1600** [Math: 780/800, Reading and Writing: 700/800] (05/11/16)
- Graded Examination in Spoken English, Trinity College, London, {CEFR B2.1} (2013)

## Professional Experience

- **Research Intern**, LTCI Lab, INFRES Department, Telecom Paris. (02/21 – 08/21)
  - > US Army Project; "Prototyping & development in the framework of the Architecture-Centric Model Management (ACMoM) project.
  - > Received Charpak Lab Scholarship 2021 [French Embassy, India] (05/21 – 06/21)

- **Research Assistant**, Applied & Environmental Biotechnology Lab, BITS Goa. (08/20 – 01/21)
  - > State Government of Jharkhand project; "InVEST modeling and GIS inventory of wetlands".

- **Research Intern**, pixxel, Bangalore. (04/19 – 04/20)
  - > PS-1 Summer Project Title - 'Design S-band, X-band antennae for the nano-satellites, in HFSS and implement the layout in ADS.' (06/19 – 07/19)
  - > Developed preliminary patents for different antenna configurations.
  - > Designed micro-patch antenna for PoC satellite '*Anand*'.

- **Summer Intern**, Coherent Laser India Pvt. Ltd., Mumbai. (06/18 – 07/18)
  - > Learnt basic theory and operated CO2, Nd:YAG, and fiber laser systems.
  - > Performed basic troubleshooting and assisted field engineers.

- **Undergraduate Teaching Assistant,** Mathematics I (Year 3|Sem 1)

## Skill Set

- **Software**
  - > Technical: Xilinx Vivado HLS, MATLAB & Simulink, AnSYS Electromagnetics Suite, Cadence, Keysight ADS, Eagle, CPN Tools, Eclipse IDE, Eclipse Modeling Framework, OWL Protégé, ArcGIS, InVEST, pSpice, AutoCAD, LabVIEW, FESTO FluidSim, ModelSim.
  - > Languages: Python, C, C++, Verilog, VHDL, MATLAB, LaTeX, Java, ETL, OCL, VIATRA
  - > Other: Adobe Premiere Pro, Adobe Photoshop, Adobe Audition.

- **Hardware:** Vector Network Analyzer (VNA) | Workshop: Manual and Power Tools

# Scientific Activity

## Peer-reviewed publications

### Journals

- *R. Mittal, A.A. Prince, S. Nalband, F. Robert, A.R.J. Fredo*, "Low-Power Hardware Accelerator for Detrending Measured Biopotential Data", 2020, IEEE Transactions on Instrumentation & Measurement.
- *R. Mittal, A.A. Prince, S. Nalband, F. Robert, A.R.J. Fredo*, "Modified-MaMeMi Filter Bank for Efficient Extraction of Brainwaves from Electroencephalograms". 2021, Elsevier Biomedical Signal Processing & Control.
- *R. Mittal, A.A. Prince*, "Low-Power Hardware Accelerator Circuit Architecture for Detrending High-Definition Biomedical Signals". (in review, IEEE-TBioCAS)

### Conferences/Workshops

- {Short Paper} *R. Mittal, R. Banerjee, S. Sarkar, S. Bandyopadhyay*, "Translation Validation of Code-Optimizing Transformations, Involving Loops, using Petri Net-based Program Models", 2020, Workshop PNSE.
- {Short Paper} *R. Mittal, R. Banerjee, D. Blouin, S. Bandyopadhyay*, "Approach for Translation Validation of Thread-Level Parallelizing Transformations using Color Petri Nets", 2021, ICSOFT
- {Short Paper} *R. Mittal, D. Blouin, S. Bandyopadhyay*, "Approach to Define Workflow and Validate Extended Feature Models and Configurations using Petri Nets". (in-review, SPLC 2021)

## Non-peer-reviewed publications

### Book Chapter

- Chapter 3: "A Feature-Based Ontology for Cyber-Physical Systems" in 'Multi-Paradigm Modelling Approaches for Cyber-Physical Systems', Academic Press, Elsevier.

### Reports/Deliverables

- "Impact of Negative Factors and Importance of Monitoring Natural Wetland Ecosystems in Jharkhand: A Report". {Funded by Forest Dept., State Govt. of Jharkhand, India}
- Action ICT1404 (MPM4CPS) WG1 Deliverable WG1.2: "Framework to Relate / Combine Modeling Languages and Techniques". {Funded by EU ICT COST}
- Action ICT1404 (MPM4CPS) WG1 Deliverable WG1.1: "State-of-the-Art on Current Formalisms used in Cyber-Physical Systems Development". {Funded by EU ICT COST}

### Posters

- *R. Mittal, D. Blouin, S. Bandyopadhyay*, "Validating Extended Feature Model Configurations using Petri Nets", 2021, Workshop PNSE (accepted).
- *R. Mittal, S. Bandyopadhyay*, "Translation Validation of Scheduled Conditional Behavior using Petri Net based Program Models", 2021, Workshop PNSE (accepted).

## Recognition

- *[Bronze Medal] R. Mittal*, "Translation Validation of Thread-Level Parallelizing Transformations using Color Petri Nets", ACM Student Research Competition Grand Finals Undergraduate Track 2021.
- *[Gold Medal] R. Mittal*, "SamaTulyataII: Validation of Code-Optimizing Transformations Involving Loops for Petri Net Based Models of Programs", ACM Student Research Competition Undergraduate Track, PLDI-2020.

## Organization

- *Auxiliary reviewer*, International Conference on Information Systems Development (ISD) 2021.
- *Auxiliary reviewer*, International Conference on Software Engineering (ICSOFT) 2021.
- *Coordinator*, Current Trends in Cyber-Physical Systems (CTiCPS) 2020, online seminar.

## Parallel-curricular

- **Core Member**, Alumni Relations Cell, BITS Goa. (2017 – 2019)
- **Member**, The Drama Club, BITS Goa.
  - > **Writer and Director**, Best Original Script for 'Vishm Jwar' (Hindi) Unmaad 2019
    A full-length period drama revolving around the caste-system in India IIM Bangalore
- **Co-director and Editor**, music video for Baatein by Gravity (2019)
- **Co-director and Editor**, music video for Why You Trippin' by Xplicit

## Academic Projects

- **Academic Research Assistant**, Reconfigurable Computing Lab, BITS Goa.
  - > {Design Project} 'Design & implementation of *Butterfly Architecture*' (Year 4|Sem 2)
  - > {Design Project} 'Machine Learning methods for MoMaMeMi filter' (Year 4|Sem 1)
  - > {Lab Project} 'Development of algorithm of an EEG decomposer' (Year 3|Sem 2)
  - > {Study Project} 'Implementation of MaMeMi filter on Xilinx FPGA' (Year 3|Sem 1)

- **Academic Research Assistant**, Dept. of CSIS, BITS Goa.
  - > {Lab Project} 'SamaTulyataII formal proofs for verification' (Year 4|Sem 2)
  - > {Study Project} 'Modelling & verification of cyber-physical systems' (Year 4|Sem 1)