RAKSHIT MITTAL

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Formal Education

MSc. Mathematics   (expected grad: 06/22)

B.E.(Hons) Electronics and Instrumentation   (dual-degree program)

CGPA − 7.46 at the end of 8/10 semesters.

Birla Institute of Technology and Science Pilani, Goa Campus, India.

Merit Scholarship [Year 2], Technical Support Fund [2021], BITSAA Research Scholarship [2021]

Secondary school (CBSE): CGPA − 10/10   (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 Govt 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 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 CO_2, Nd:YAG, and fiber laser systems.
  - Performed basic troubleshooting and assisted field engineers.

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,* "Time-sliced Architecture for Low-Area Accelerator to Detrend High-Definition Electroencephalograms". (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

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

Academic Projects

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

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

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