Adway Girish

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Second-Year Ph.D. Candidate
Information Theory Laboratory, Information Processing Group (IPG)
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Research Interests

Information and coding theory and **applied probability**, particularly in **learning** and **communication systems**

Education

EPFL (*Swiss Federal Institute of Technology in Lausanne*) *Lausanne, Switzerland*
Ph.D. in Computer and Communication Sciences Sep. 2022—Present
Advisor: Prof. Emre Telatar; CGPA: *5.95/6*

IIT Bombay (*Indian Institute of Technology Bombay / IITB*) *Mumbai, India*
B.Tech. in Electrical Engineering Jul. 2018—May 2022
With Honors in Electrical Engineering and Minor in Mathematics; CGPA: *9.60/10*

Publications

Conference papers:

[C3] F. Z. Faizal, **A. G.**, *et al.*, "ICQ: A quantization scheme for best-arm identification over bit-constrained channels," in *International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt)*, 2023 [IEEE Xplore]

[C2] S. Sharma, **A. G.**, *et al.*, "Micro-Doppler parameter estimation using variational mode decomposition with finite rate of innovation," in *IEEE International Conference on Signal Processing and Communications (SPCOM)*, 2022 [IEEE Xplore]

[C1] S. Sharma, **A. G.**, *et al.*, "Theoretical analysis of an inverse Radon transform based multicomponent micro-Doppler parameter estimation algorithm," in *National Conference on Communications (NCC)*, 2022 [IEEE Xplore]

Preprints:

[P1] A. V. Makkuva, M. Bondaschi, **A. G.**, *et al.*, "Attention with Markov: A framework for principled analysis of transformers via Markov chains," in *arXiv cs.LG*, 2024 [arXiv]

Awards and Prizes

- Institute Academic Prize for being the second-best academic performer in the EE department at IITB *[2020-21]*
- IITB Undergraduate Research Award (URA01) for work done in Radar Signal Processing *[2020]*
- Urvish Medh Memorial Prize for being the highest-ranked student in the EE department at IITB *[2018]*
- Kishore Vaigyanik Protsahan Yojana (KVPY) fellowship from the Indian Institute of Science (IISc) *[2016]*
- National Talent Search (NTS) scholarship by National Council of Educational Research and Training (NCERT) *[2016]*

Academic Achievements

- Grade 6.0 (exceptional performance, over 95%) in four courses at EPFL *[2022—present]*
- AP grades (top 2%) in Digital Communications, Data Analysis at IITB *[2021, 2019]*
- All-India Ranks of 43 in JEE (Advanced) and 55 in JEE (Main) *[2018]*
- Final stage of Indian team selection for international chemistry and astronomy olympiads (IOAA and IChO) *[2018]*
- All-India Rank of 35 in KVPY *[2016]*

Teaching

Graduate Teaching Assistant (EPFL)   Fall 2023; Spring 2023, 2024
Principles of Digital Communications, Information Theory and Coding
- Conducted weekly exercise sessions for problem-solving and doubt-clearing
- Collaborated with the instructor on preparing exams and grading answer papers
- Responsible for handling all course logistics, particularly for the Digital Communications course project: set up servers to simulate noisy channels

Undergraduate Teaching Assistant (IITB)   Fall 2019, 2020, 2021; Spring 2020
Electricity and Magnetism, Calculus
- Mentored batches of 45+ students by conducting weekly tutorial sessions and periodic doubt-clearing sessions
- Responsible for grading exam papers and assignments, and invigilation during exams

Industry Experience

Evaluation of Baseband Behavioural Models for Power Amplifiers   *Summer Internship*
Texas Instruments (India), Bangalore, India   May 2021—Jul. 2021
- Performed literature review of Volterra series and Memory Polynomial models and identified reasonable ones to pursue
- Implemented these models on MATLAB, obtaining considerable improvement over those presently in use
- Devised a 'peeling' algorithm to make the model implementable on an FPGA and ready for use in a real product

Mentoring and Responsibility

Summer of Science Mentor   Summer 2023, 2022, 2020
Math and Physics Club, IITB
- Guided a total of six students on self-paced reading projects in signal processing, information theory and coding theory by suggesting references and having discussions to clear doubts
- Designed mini-projects based on the reading material for hands-on experience and reviewed their final reports

Institute Student Mentor   Jun. 2021—May 2022
for incoming undergraduates at IITB
- Mentored 12 first-year students, helping them have a comfortable transition and adaptation to college life
- Functioned as the single point of contact for any issues they faced, in particular ensuring that they had the resources to attend online classes from home

Class Representative   Jul. 2018—May 2019
for the first-year batch of B.Tech. in Electrical Engineering at IITB (69 students)
- Created effective communication channels to ensure that all students were kept updated on relevant issues
- Mediated discussions between faculty and the class as a whole to allow for smooth proceedings of courses

Relevant Graduate-Level Coursework   **: EPFL, **: IITB and EPFL*, (default)*: IITB*

- **Probability and statistics:** Learning theory*, Stochastic calculus*, Advanced probability and random processes**, Markov chains and algorithmic applications*, Stochastic optimization, Online learning and bandit algorithms, Estimation and identification
- **Communication theory and systems:** Advanced topics in information theory*, Information theory and coding**, Error-correcting codes, Communication networks, Wireless and mobile communication
- **Mathematics:** Distribution theory*, Convex optimization*, Finite fields and their applications, Fourier analysis, Basic algebra, Complex analysis, Real analysis

Extracurriculars

- Intermediate course in Table Tennis under the National Sports Organization at IITB *[2018-19]*
- Best All-Rounder on graduation from Ryan International School Bangalore *[2016]*
- Deputy Education Minister in the Student Council at Ryan International School Bangalore *[2014-15]*
- Completed 19 credits in electronic keyboard from the Trinity College of Music London *[2007-13]*