

# Adway Girish

Third-Year Ph.D. Candidate  
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## Research Interests

**Information and coding theory** and its applications to **security**, **learning** and **communication**

## 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

**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

<sup>\*</sup>, <sup>†</sup> denote equal contribution

### Conference proceedings

- [C5] A. Nagle<sup>\*</sup>, **A. G.**<sup>\*</sup>, M. Bondaschi, M. Gastpar, A. V. Makkuva<sup>†</sup>, and H. Kim<sup>†</sup>, “Fundamental limits of prompt compression: A rate-distortion framework for black-box language models,” in *The Thirty-Eighth Annual Conference on Neural Information Processing Systems (to appear)*, 2024 [Also **oral** (top 4 of 58) at ICML TF2M workshop 2024][[arXiv](#)]
- [C4] A. V. Makkuva<sup>\*</sup>, M. Bondaschi<sup>\*</sup>, C. Ekbote, **A. G.**, A. Nagle, H. Kim, and M. Gastpar, “Local to global: Learning dynamics and effect of initialization for transformers,” in *The Thirty-Eighth Annual Conference on Neural Information Processing Systems (to appear)*, 2024 [Also poster at ICML TF2M workshop 2024][[arXiv](#)]
- [C3] F. Z. Faizal, **A. G.**, M. K. Hanawal, and N. Karamchandani, “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.**, D. Jeff, G. Sresth, S. Bhalerao, V. M. Gadre, C. H. Srinivas Rao, and P. Radhakrishna, “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.**, N. P. Rakhashia, V. M. Gadre, S. ul Haque, A. Ansari, R. B. Pachori, P. Radhakrishna, and P. Sahay, “Theoretical analysis of an inverse Radon transform based multicomponent micro-Doppler parameter estimation algorithm,” in *National Conference on Communications (NCC)*, 2022 [[IEEE Xplore](#)]

### Workshop papers

- [W1] A. V. Makkuva<sup>\*</sup>, M. Bondaschi<sup>\*</sup>, **A. G.**, A. Nagle, M. Jaggi, H. Kim, and M. Gastpar, “Attention with Markov: A framework for principled analysis of transformers via Markov chains,” in *ICML Workshop on Mechanistic Interpretability*, 2024[[arXiv](#)]

## Awards and Prizes

- EDIC fellowship for first year of PhD at EPFL [2022–23]
- 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 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

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

## Industry Experience

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### 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

## Teaching and Responsibility

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### Academic service

- Reviewer for conferences and workshops: ISIT ’24, ICML NCW ’23 [2023–present]

### Teaching

- Graduate Teaching Assistant for information theory and digital communications at EPFL [2022–present]
- Teaching Assistant for calculus and electromagnetism a total of 4 times at IITB [2019–22]

### Mentoring and Leadership

- RAMP Mentor for EPFL PhD applicants, EPIC buddy for admitted PhD students at EPFL [2023–present]
- Summer of Science Mentor for signal processing, coding theory, probability and information theory at IITB [2020–2024]
- Institute Student Mentor for first-year undergraduates at IITB [2021–22]
- Class Representative for the 2018–22 batch of B.Tech. in Electrical Engineering at IITB [2018–19]

## Relevant Graduate-Level Coursework

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

## Extracurriculars

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- 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]