

# IRSHAD AHMAD MEER

PostDoc at KTH, Stockholm, Sweden

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🏠 KTH Profile 🌐 GitHub 📄 Google Scholar

## WORK EXPERIENCE

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### Postdoctoral Researcher

KTH Royal Institute of Technology

Stockholm, Sweden

*Apr 2025 – Present*

- Contributed to the successful KTH-led proposal *3D-NET: 6G Integrated Satellite Networks*, securing 15 M SEK in funding from **Vinnova**, Sweden's innovation agency, for research on integrated terrestrial, non-terrestrial, and satellite 6G systems.
- Contributed to the proposal for the **SSF Drone Swarms strategic research center**, which has been shortlisted for the final evaluation stage of a 60 M SEK national research initiative on autonomous drone swarms.
- Leading KTH's AI research activities in the **RAI-6Green** project with **Tele2**, developing machine learning and real network data-driven optimization methods for energy-aware RAN operation, including battery peak-shaving and price-aware control.
- Developing explainable AI methods for cellular network control by integrating deep reinforcement learning, feature attribution techniques, and LLM-assisted analysis, with initial results reported in [C8].
- Co-supervising multiple M.Sc. theses in AI for wireless systems, including satellite communications, integrated sensing and communication (ISAC), Wi-Fi sensing, and cell-free massive MIMO.

### Visiting Student Research Collaborator

Princeton University

New Jersey, USA

*Mar 2023 – Sep 2024*

- Led the design of a hierarchical multi-agent deep reinforcement learning (H-MADRL) framework for dynamic resource orchestration in distributed wireless networks.
- Developed a scalable AI-based mobility management solution combining cluster formation and power allocation under reliability constraints in multi-connectivity systems.
- Proposed an action-conditioned hierarchical learning mechanism enabling coordination between centralized and distributed agents for large-scale network control.
- Demonstrated improved energy efficiency, reliability, and scalability compared with centralized optimization and distributed learning baselines [C5, C6, J4].

### Software Developer

Infosys Technologies Limited

Mysore, India

*Oct 2014 – Jun 2016*

- Worked as a full-stack developer for the Global Immigration and Compliance System, a large-scale .NET and Windows services-based MVC application automating Infosys's end-to-end immigration workflow.

## EDUCATION

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### KTH Royal Institute of Technology

Ph.D. in Information and Communication Technology

Thesis Title: **AI-Assisted Mobility Management for Cellular Connected UAVs**

Stockholm Sweden

*Jan 2021 – Mar 2025*

### Politecnico di Milano

Masters in Telecommunication Engineering

Milan, Italy

*Sep 2016 – Apr 2019*

### National Institute of Technology Srinagar

B.Tech. in Electronics and Communication Engineering

Srinagar, India

*Jul 2010 – Jun 2014*

## TECHNICAL SKILLS

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- **Programming:** Python, MATLAB, Java, C#
- **Machine Learning Frameworks:** PyTorch, TensorFlow, RLlib, Stable-Baselines3
- **Research Tools:** Git, LaTeX, Visual Studio, MS SQL Server
- **Code Repositories:** 🌐 [github.com/Irshadmeer](https://github.com/Irshadmeer)

## SELECTED RESEARCH PROJECTS

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### SLDS: Self-Learning Drone Surveillance (Vinnova)

Jul 2024 – Dec 2025

Collaboration between Skysense, Securitas Technology, and KTH

- Designed a hybrid deep learning architecture for RF spectrogram analysis, combining convolutional feature extraction with transformer-based positional modeling for adaptive signal recognition.
- Developed an open-world RF signal classification framework integrating supervised representation learning, open-set recognition, clustering-based novel class discovery, and continual learning for identification of unknown signal classes and incremental adaptation to emerging categories.

### 6G-SKY: 6G for Connected Sky (CELTIC-NEXT / Eureka Cluster)

Apr 2022 – Apr 2025

Collaboration between Airbus, Ericsson, Motius, Skysense, and KTH

- Conducted research on AI-native mobility management and 3D network design for integrated aerial, terrestrial, and satellite communication systems.
- Developed multiple AI-based mobility management algorithms for seamless integration of aerial users into cellular networks; the project also formed the primary research foundation for the Ph.D. work summarized in the thesis *AI-Assisted Mobility Management for Cellular Connected UAVs*.
- Led the preparation of technical deliverables and represented KTH in project workshops and collaborative meetings.

## AWARDS & SCHOLARSHIPS

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- **Erasmus+ Mobility Scholarship**, European Commission Sept 2018 – Mar 2019  
Granted a fully funded six-month M.Sc. research exchange under the EU academic mobility program.
- **DSU Merit Scholarship**, Politecnico di Milano Sept 2016 – Sept 2018  
Received a full scholarship for M.Sc. studies, covering tuition and living costs, based on academic merit and financial eligibility.
- **National Merit Scholarship**, Government of India Jul 2010 – Jun 2014  
Awarded a full undergraduate tuition scholarship in recognition of consistent academic excellence.

## PUBLICATIONS

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Google Scholar:  Google Scholar

Citations: 126, h-index: 7, i10-index: 4

### Journal Articles

- J4. **I. A. Meer**, K.-L. Besser, M. Ozger, D. Schupke, H. V. Poor, and C. Cavdar, “Hierarchical Multi-Agent DRL Based Dynamic Cluster Reconfiguration for UAV Mobility Management,” *IEEE Transactions on Cognitive Communications and Networking*, 2026.
- J3. Y. Deng, S. Zhang, **I. A. Meer**, M. Ozger, and C. Cavdar, “Joint Trajectory and Handover Management for UAVs Co-existing with Terrestrial Users: A Multi-Agent DRL Approach,” *IEEE Transactions on Cognitive Communications and Networking*, 2025.
- J2. **I. A. Meer**, M. Ozger, D. A. Schupke, and C. Cavdar, “Mobility Management for Cellular-Connected UAVs: Model-Based Versus Learning-Based Approaches for Service Availability,” *IEEE Transactions on Network and Service Management*, vol. 21, no. 2, pp. 2125–2139, 2024.
- J1. **I. A. Meer**, M. Ozger, and C. Cavdar, “Cellular Localizability of Unmanned Aerial Vehicles,” *Vehicular Communications*, vol. 44, p. 100677, 2023.

### Conference Papers

- C9. Z. Ge, O. A. Topal, **I. A. Meer**, P. Xiao, and C. Cavdar, “EARL: Energy-Aware Adaptive Antenna Control with Reinforcement Learning in O-RAN Cell-Free Massive MIMO Networks,” *Proc. IEEE International Conference on Communications (ICC)*, 2026.
- C8. **I. A. Meer**, B. Hörmann, M. Ozger, F. Geyer, A. Viseras, D. Schupke, and C. Cavdar, “Explainable AI for UAV Mobility Management: A Deep Q-Network Approach for Handover Minimization,” *Proc. IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, 2025.
- C7. F. Giarrè, **I. A. Meer**, M. Masoudi, M. Ozger, and C. Cavdar, “Hierarchical Multi-Agent DRL for Soft Handovers Between Edge Clouds in Open RAN,” *Proc. IEEE International Conference on Machine Learning for Communication and Networking (ICMLCN)*, 2025.

- C6. **I. A. Meer**, K.-L. Besser, M. Ozger, D. Schupke, H. V. Poor, and C. Cavdar, "Learning-Based Dynamic Cluster Reconfiguration for UAV Mobility Management with 3D Beamforming," *Proc. IEEE International Conference on Machine Learning for Communication and Networking (ICMLCN)*, pp. 486–491, 2024.
- C5. **I. A. Meer**, K.-L. Besser, M. Ozger, H. V. Poor, and C. Cavdar, "Reinforcement Learning Based Dynamic Power Control for UAV Mobility Management," *Proc. Asilomar Conference on Signals, Systems, and Computers*, pp. 724–728, 2023.
- C4. Y. Deng, **I. A. Meer**, S. Zhang, M. Ozger, and C. Cavdar, "D3QN-Based Trajectory and Handover Management for UAVs Co-existing with Terrestrial Users," *Proc. International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt)*, pp. 103–110, 2023.
- C3. **I. A. Meer**, W.-H. Lee, M. Ozger, C. Cavdar, and K. W. Sung, "Low-Latency MAC Design for Pairwise Random Networks," *Proc. IEEE Vehicular Technology Conference (VTC-Spring)*, pp. 1–6, 2022.
- C2. **I. A. Meer**, M. Ozger, and C. Cavdar, "On the Localization of Unmanned Aerial Vehicles with Cellular Networks," *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, pp. 1–6, 2020.
- C1. **I. A. Meer**, M. Ozger, M. Lundmark, K. W. Sung, and C. Cavdar, "Ground Based Sense and Avoid System for Air Traffic Management," *Proc. IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, pp. 1–6, 2019.

## Theses

- **I. A. Meer**, "AI Assisted Mobility Management for Cellular Connected UAVs," Ph.D. dissertation, KTH Royal Institute of Technology, 2025.
- **I. A. Meer**, "Integration of Unmanned Aerial Vehicles Into the National Airspace," M.Sc. thesis, Politecnico di Milano, Italy, 2019.

## INVITED TALKS & TUTORIALS

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- Tutorial Co-Instructor (with C. Cavdar and M. Ozger), "6G for Connected Sky: Multi-Layered Architectures, Network Design, Management and Open Issues," IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 1 September 2025.

## TEACHING EXPERIENCE

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### Teaching Assistant, IK2508 Wireless Transmission Techniques

2022 –2023

KTH Royal Institute of Technology

- Conducted numerical problem-solving sessions and tutorials.
- Assisted with laboratory exercises and student seminars.
- Participated in exam evaluation and grading.

### Teaching Assistant, IK2510 Wireless Networks

2025

KTH Royal Institute of Technology

- Responsible for examination grading and evaluation of student submissions.

## MASTER'S THESIS SUPERVISION

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10 M.Sc. theses co-supervised (3 continuing to Ph.D. studies)

### Ongoing

- 10. Yunquan Chen, M.Sc. thesis titled "Scalable Energy-Aware Adaptive Antenna Control with Transformer-Based Reinforcement Learning in O-RAN Cell-Free Massive MIMO Networks", KTH Royal Institute of Technology, expected 2026.
- 9. Shreyashee Roy, M.Sc. thesis titled "LEO Satellite Assisted Cell-Free Massive MIMO ISAC System for Real-Time Aircraft Tracking", KTH Royal Institute of Technology, expected 2026.
- 8. Naresh Kumar Anguraj, M.Sc. thesis titled "Macro Offload Benefits from an Indoor Deployment", Ericsson and KTH Royal Institute of Technology, expected 2026.
- 7. Jing Yang, M.Sc. thesis titled "Feasibility of Applications Based on Wi-Fi Sensing", Autoliv and KTH Royal Institute of Technology, expected 2026.

### Completed

6. Fangpu Zhang, M.Sc. thesis titled “Joint Sampling and Carrier Allocation for UAV–Satellite Video Transmission: Optimization and Reinforcement Learning Approaches”, KTH Royal Institute of Technology, 2025. Now Ph.D. student.
5. Julie Liu, M.Sc. thesis titled “Incremental Learning Based Unknown Drone Classification”, KTH Royal Institute of Technology, 2025.
4. Shen Liu, M.Sc. thesis titled “Joint Trajectory Designing and Association Scheduling for UAV-Enabled Data Collection and Charging System in Space-Air-Ground Integrated Networks”, KTH Royal Institute of Technology, 2025.
3. Zilin Ge, M.Sc. thesis titled “Reinforcement Learning Based Centralized Joint Orchestration of Radio, Processing, and Fronthaul Resources for Energy Efficient Cell-Free Massive MIMO Networks”, KTH Royal Institute of Technology, 2025.
2. Federico Giarre, M.Sc. thesis titled “Service Continuity between Edge Clouds in O-RAN: A Deep Reinforcement Learning Approach”, KTH Royal Institute of Technology, 2024. Now Ph.D. student.
1. Yuhang Deng, M.Sc. thesis titled “Joint Trajectory and Handover Management for UAVs Co-existing with Terrestrial Users”, KTH Royal Institute of Technology, 2023. Now Ph.D. student.

## PROFESSIONAL SERVICE

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### Journal Reviewer

- IEEE Transactions on Wireless Communications (TWC)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Network and Service Management (TNSM)
- IEEE Transactions on Cognitive Communications and Networking (TCCN)
- IEEE Open Journal of the Communications Society

### Selected Service Recognition

- Reviewer Recognition Certificate, IEEE Transactions on Mobile Computing, IEEE Computer Society

### Conference Technical Program Committee (TPC) Member / Reviewer

- IEEE International Conference on Communications (ICC)
- IEEE Global Communications Conference (GLOBECOM)
- IEEE International Conference on Machine Learning for Communication and Networking (ICMLCN)
- IEEE Vehicular Technology Conference (VTC)
- IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)

## REFERENCES

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- Prof. Cicek Cavdar  
Department of Computer Science, KTH, Stockholm, Sweden  
Email: cavdar@kth.se
- Prof. H. Vincent Poor  
Department of Electrical and Computer Engineering, Princeton University, NJ, USA  
Email: poor@princeton.edu
- Prof. Mustafa Özger  
Department of Electronic Systems, Aalborg University, Denmark  
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