

# MELTEM TATLI

Mobile: +1 518 334 9328

Email: meltemtatli27@gmail.com

 <https://www.linkedin.com/in/meltem-tatli/>

## SUMMARY

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PhD student working at the intersection of wireless communication and machine-learning algorithms. I develop efficient decision-making methods, including multi-armed bandits for risk-aware resource selection.

## EDUCATION

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**Rensselaer Polytechnic Institute**, Troy, NY 2023 - Present

Ph.D in Electrical Engineering

GPA: 4.00/4.00

**Research Statement:** Trustworthy decision-making: risk-sensitive bandits, preference-centric learning

**Bilkent University**, Ankara, Turkey

2019 - 2023

Bachelor of Science in Electrical and Electronics Engineering

GPA: 3.90/4.00, 2nd/152

## PUBLICATIONS AND PRESENTATIONS

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**Meltem Tatli**, Arpan Mukherjee, Prashanth L.A., Karthikeyan Shanmugam, and Ali Tajer, "Risk-sensitive bandits: Arm-mixture optimality and regret-efficient algorithms," AISTATS 2025.

**Meltem Tatli**, Ali Tajer. "Preference-centric bandits in wireless communications: Theory and applications," AI4NextG Workshop at NeurIPS, Oral presentation, 2025.

## MANUSCRIPT UNDER REVIEW

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**Meltem Tatli**, Ali Tajer. "Tail-aware bandit learning for communication," under review, 2026.

**Meltem Tatli**, Arpan Mukherjee, Prashanth L. A., Karthikeyan Shanmugam, Ali Tajer. "Preference-centric Bandits: Optimality of Mixtures and Regret-efficient Algorithms," Submitted to IEEE Transactions on Information Theory, 2025.

## RESEARCH EXPERIENCE

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**Research Assistant, Rensselaer Polytechnic Institute**, Troy, NY 2023 - Present

### Preference-centric Bandits for Wireless Communications

- Applied preference-centric bandit algorithms to optimize rate selection under fading, improving epsilon outage capacity over standard baselines
- Integrated theoretical results into simulation-based physical layer evaluations, enabling fast design exploration for wireless systems
- Showed mixture-based scheduling can outperform deterministic strategies in 5G-like discrete-rate settings

### Risk-Sensitive Multi-Armed Bandits

- Designed bandit algorithms that optimize user-specified risk functionals (CVaR, Dual Power, PHT) rather than expected reward
- Proved finite-time regret guarantees using probabilistic concentration tools
- Built and maintained a reproducible Python/NumPy simulation pipeline to validate theoretical predictions across multiple synthetic bandit instances and risk functionals

**Undergraduate Researcher, Bilkent University Archlab**, Ankara, Turkey

2022 - 2023

- Worked on classification problems using regression models and feature-analysis tools such as PCA
- Implemented custom neural-network architectures in Python using Keras

**Summer Intern, Fraunhofer IIS**, Erlangen/Germany

2022

- Tuned hyperparameters of a neural network used in the MPEG-H for speech-background separation
- Added FCNN components and implemented multi-domain, multi-resolution losses in PyTorch

## SKILLS

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**ML & AI:** Reinforcement Learning, Multi-Armed Bandits, Optimization

**Tools & Programming:** PyTorch, NumPy, Python, MATLAB, LaTeX, Jupyter

## PROJECTS

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<b>Transformer Image Captioning, <i>PyTorch</i></b>	<b>2025</b>
<ul style="list-style-type: none"><li>• Implemented a Transformer-based captioning model in PyTorch and benchmarked on Multi30K with BLEU 37</li></ul>	
<b>Partially Observable Markov Decision Process, <i>Numpy</i></b>	<b>2024</b>
<ul style="list-style-type: none"><li>• Collaborated as part of a two-person team to design and develop algorithms, including Monte Carlo tree search, forward search, lookahead with rollouts, and QMDP, for a robot whose behavior is modeled as a Partially Observable Markov Decision Process (POMDP)</li></ul>	
<b>Capstone, <i>Tensorflow, Pandas, Numpy</i></b>	<b>2023</b>
<ul style="list-style-type: none"><li>• Energy consumption optimization project led by a team of 6 and supported by a leading household application company Arcelik</li><li>• Implemented an LSTM model to accurately predict the future temperatures of the refrigerator compartments with a team of three</li><li>• Combined LSTM algorithm with a PID algorithm which was later embedded to a microcontroller</li><li>• Showed using LSTM in motherboard microcontroller decreases energy consumption of the fridge</li></ul>	

## SERVICE

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<b>Graduate Senator, RPI Student Senate and Graduate Council</b>	<b>2025 - Present</b>
<ul style="list-style-type: none"><li>• Surveyed more than 130 students to improve off-campus housing conditions</li><li>• Organized the summer picnic for graduate students</li><li>• Analyzed and matched the students for mentor-mentee program (GradGuide)</li></ul>	
<b>Student Mentor, RPI</b>	<b>2025</b>
<ul style="list-style-type: none"><li>• Under the GradGuide program by Graduate Council, mentored two graduate students</li></ul>	
<b>Publicity Coordinator, RPI ECSE Graduate Council</b>	<b>2025 - Present</b>
<b>President,</b>	<b>2025</b>
<b>Vice President,</b>	<b>2024 - 2025</b>
<b>Graduate Student Representative,</b>	<b>2023 - 2024</b>
<ul style="list-style-type: none"><li>• Designs event flyers and drove outreach that increased visibility and participation across the department</li><li>• Advocates for student concerns to department and institute leadership</li><li>• Led meetings</li><li>• Organized welcome social for the new students, TA information session, and ice-skating events to enhance student engagement</li></ul>	

## AWARDS

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<b>Founders Award of Excellence, RPI</b>	<b>2024</b>
<ul style="list-style-type: none"><li>• Recognized for academic achievement, leadership, creativity, and contributions to the RPI community</li></ul>	
<b>Jerry Dziuba ECSE Graduate Student Service Award, RPI</b>	<b>2024</b>
<ul style="list-style-type: none"><li>• Awarded for exceptional service and dedication to the graduate community</li></ul>	