FETHİYE IRMAK DOĞAN

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OBJECTIVE

Endowing robots with the ability of semantic reasoning and scene understanding for autonomously operating them in human environments

AREAS OF INTEREST

Human-Robot Interaction, Machine Learning, Deep Learning, Artificial Intelligence, Computer Vision

EDUCATION

Ph.D. in Computer Science, KTH Royal Institute of Technology 01.2018-03.2023
- Thesis on *Robots That Understand Natural Language Instructions and Resolve Ambiguities*

M.Sc. in Computer Engineering, Middle East Technical University 09.2015-01.2018
- Thesis on *Hierarchical Incremental Context Modeling on Robots*
- Graduated with High Honor degree - CGPA: 3.93/4.00

B.Sc. in Computer Engineering, Middle East Technical University 09.2010-06.2015
- Graduated with Honor degree - CGPA: 3.40/4.00

EMPLOYMENT, EXPERIENCE AND PROJECTS

Postdoctoral researcher at the Division of Robotics, Perception and Learning, KTH Royal Institute of Technology, SWEDEN 03.2023-present
- Focusing on continual learning for robots in human environments to understand their routines and help them with their daily household tasks

Doctoral researcher at the Division of Robotics, Perception and Learning, KTH Royal Institute of Technology, SWEDEN 01.2018-03.2023
- Working on different follow-up clarification techniques (semantic or visual) for robots to resolve ambiguities in user instructions, supervised by Iolanda Leite

Visiting scholar at the Robot Autonomy and Interactive Learning (RAIL) Lab, Georgia Institute of Technology, USA 11.2021-04.2022
- Developing a semantically-driven disambiguation method to handle ambiguous user requests with clarifying questions, supervised by Sonia Chernova

Participating in Oxford Machine Learning Summer School 2021 07.2021-08.2021
- Selected to participate in the highly selective summer school ($\sim$ 15% acceptance rate) for best-in-class training on machine learning and deep learning

Participating in Amazon Alexa Prize, Fantom Social Bot 02.2018-08.2018
- Selected as one of 8 teams among the applicants from leading 195 universities to create a social bot, supervised by Gabriel Skantze

Researcher at KOVAN Robotics Research Lab, Department of Computer Engineering, Middle East Technical University, TURKEY 09.2015-01.2018
- Incremental context modeling for robots to make them capable of adapting to challenging real-world environments, supervised by Sinan Kalkan

Senior Design Project at Department of Computer Engineering, Middle East Technical University, TURKEY 09.2014-06.2015
- 3D animation of fMRI data to visualize the cognitive processes in the brain, supervised by Fatos Tunay Yarman Vural

Internship at The Maersk Mc-Kinney Moller Institute, University of Southern Denmark, DENMARK 06.2014-09.2014
- A plugin providing a graphical user interface for automated calibration of UR robot arms, supervised by Norbert Krueger

Internship at KOVAN Robotics Research Lab, Department of Computer Engineering, Middle East Technical University, TURKEY 06.2013-09.2013
- Visualizing the 2D and 3D representations of the iCub robot's vision, supervised by Sinan Kalkan

Part time software developer at Özgür Yazılım Company, TURKEY 02.2013-06.2013
- Taking a role in the development of the Tekir Accounting Program

TEACHING

Teaching Assistant at KTH Royal Institute of Technology, SWEDEN 01.2019-03.2023
- Master-level machine learning course

Teaching Assistant at Middle East Technical University, TURKEY 02.2014-06.2014
- C programming language course

MENTORING

KTH Royal Institute of Technology, SWEDEN 01.2019-present
- *PhD Students*: Ermanno Bartoli, and Anna Deichler
- *Master Students*: Shipra Jain, Jiaming Huang, Amrita Panesar, and Georgios Hadjiantonis
- *Research Engineers*: Shreya Kohli, Rasmus Rudling, and Alex Sleat
- *High School Intern*: Erik Eriksson

Georgia Institute of Technology, USA 11.2021-04.2022
- *Master Student*: Aswin Gururaj Prakash

SCIENTIFIC CONTRIBUTIONS

Journal Articles

J1 **F. I. Doğan**, W. Liu, I. Leite, and S. Chernova, 'Semantically-Driven Disambiguation for Human-Robot Interaction,' *ACM Transactions on Human-Robot Interaction (THRI)*. (in preparation)

J2 **F. I. Doğan**, G. I. Melsión, and I. Leite, 'Leveraging Explainability for Understanding Object Descriptions in Ambiguous 3D Environments,' *Frontiers in Robotics and AI*, 2023.

J3 **F. I. Doğan**, S. Gillet, E. J. Carter, and I. Leite, 'The Impact of Adding Perspective-Taking to Spatial Referencing during Human-Robot Interaction,' *Robotics and Autonomous Systems (RAS)*, 2020.

Refereed Conference Publications

C1 E. Bartoli, **F. I. Doğan**, and I. Leite 'Streaming Network for Continual Learning of Object Relocations under Household Context Drifts', *International Conference on Robotics and Automation (ICRA)*, 2024. (under review)

C2 **F. I. Doğan**, I. Torre , and I. Leite, 'Asking Follow-Up Clarifications to Resolve Ambiguities in Human-Robot Conversation,' *International Conference on Human-Robot Interaction (HRI)*, 2022.

C3 M. Iovino, **F. I. Doğan**, I. Leite, and C. Smith, 'Interactive Disambiguation for Behavior Tree Execution,' *International Conference on Humanoid Robots (Humanoids)*, 2022.

C4 A Panesar, **F. I. Doğan**, and I. Leite, 'Improving Visual Question Answering by Leveraging Depth and Adapting Explainability' *International Conference on Robot & Human Interactive Communication (RO-MAN)*, 2022.

C5 **F. I. Doğan**, S. Kalkan, and I. Leite, 'Learning to Generate Unambiguous Spatial Referring Expressions for Real-World Environments,' *International Conference on Intelligent Robots and Systems (IROS)*, 2019.

C6 P. Jonell, P. Fallgren, **F. I. Doğan**, J. Lopes, U. Wennberg, and G. Skantze, 'Crowdsourcing a self-evolving dialog graph,' *International Conference on Conversational User Interfaces (CUI)*, 2019.

C7 **F. I. Doğan***, İ. Bozcan*, M. Celik, and S. Kalkan, 'Cinet: A learning based approach to incremental context modeling in robots,' *International Conference on Intelligent Robots and Systems (IROS)*, 2018.

C8 **F. I. Doğan**, H. Çelikkanat, and S. Kalkan, 'A Deep Incremental Boltzmann Machine for Modeling Context in Robots,' *International Conference on Robotics and Automation (ICRA)*, 2018.

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* Equal Contribution

C9 **F. I. Doğan**, H. Çelikkanat, and S. Kalkan, 'Robotlarda Bağlamın Derin Artırımlı Boltzmann Makineleri ile Modellenmesi,' *Turkey Robotics Conference (ToRK)*, 2018. (written in Turkish)

C10 **F. I. Doğan**, S. Kalkan, 'Bağlamın Hiyerarşik Doğası,' *Turkey Robotics Conference (ToRK)*, 2016. (written in Turkish)

C11 O. Yıldız, **F. I. Doğan**, İ. Öztekin, E. Mızrak, and F. T. Y. Vural, 'A robust normalization method for fMRI data for brain decoding,' *Signal Processing and Communication Application Conference (SIU)*, 2016.

Workshop Proposals

P1 E. Yadollahi, M. Romeo, **F. I. Doğan**, W. Johal, M. D. Graaf, S. Levy-Tzedek and I. Leite, 'Explainability for Human-Robot Collaboration,' *International Conference on Human-Robot Interaction (HRI)*, 2024. (under review)

P2 M. Pattel*, **F. I. Doğan***, Z. Zeng, K. Baraka, and S. Chernova, 'Semantic Scene Understanding for Human-Robot Interaction,' *International Conference on Human-Robot Interaction (HRI)*, 2023.

P3 W. Johal, L. Phaijit, **F. I. Doğan**, A. Tabrez, and M. Graaf, 'HRI for Explainable Robotics,' *International Conference on Robot & Human Interactive Communication (RO-MAN)*, 2023.

Refereed Workshop Publications

W1 E. Bartoli, **F. I. Doğan**, and I. Leite, 'Contextualized Knowledge Graph Embeddings for Activity Prediction in Service Robotics,' *Workshop on Semantic Scene Understanding for Human-Robot Interaction, HRI*, 2023.

W2 **F. I. Doğan**, 'Social Robots That Understand Natural Language Instructions and Resolve Ambiguities,' *RSS Pioneers Workshop, RSS*, 2021.

W3 I. Torre, **F. I. Doğan**, and D. Kontogiorgos, 'Voice, Embodiment, and Autonomy as Identity Affordances,' *Workshop on Robo-Identity: Exploring Artificial Identity and Multi-Embodiment, HRI*, 2021.

W4 **F. I. Doğan**, and I. Leite, 'Open Challenges on Generating Referring Expressions for Human-Robot Interaction,' *Workshop on Natural Language Generation for Human-Robot Interaction, INLG*, 2020.

W5 **F. I. Doğan**, H. Çelikkanat, I. Bozcan, and S. Kalkan, 'Learning to Increment A Contextual Model,' *Workshop on Continual Learning, NeurIPS*, 2018.

Technical Reports

T1 P. Jonell, M. Bystedt, **F. I. Doğan**, P. Fallgren, J. Ivarsson, M. Slukova, U. Wennberg, J. Lopes, J. Boye, and G. Skantze, 'Fantom: A crowdsourced social chatbot using an evolving dialog graph,' *Proceedings of Alexa Prize*, 2018.

T2 **F. I. Doğan**, and S. Kalkan, 'Hierarchical Context Modeling Using Incremental Deep Boltzmann Machines,' *Technical Report No: METU-CENG-TR-2017-01, Dept. of Computer Engineering, Middle East Technical University*, 2017.

TALKS, DEMOS AND POSTERS

Seminar Talks

- Talking Robotics (a series of seminars about Robotics and its interaction with other relevant fields, such as AI and HRI), 2021
- Oxford Machine Learning Summer School, Unconference Track, 2021
- The Robot Autonomy and Interactive Learning (RAIL) Research Lab, School of Interactive Computing, Georgia Institute of Technology, 2021
- Image Lab, Department of Computer Engineering, Middle East Technical University, 2021

System Demonstration

- Invited demo on SIGDIAL Conference 2019

Poster presentations

- AI-CARING Symposium 2022

- SpLU-RoboNLP Workshop at the Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-HLT 2019)
- SoRos Workshop 2018 and 2019
- Amazon Alexa Prize Summit 2018

HONORS, AWARDS AND GRANTS

- Fellowship from the Postdoc-NeT-AI in AI and Robotics (2022) which brings together outstanding early-career researchers with leading German institutions
- RSS Pioneer 2021, selected to participate in the Robotics: Science and Systems (RSS) Pioneers, which brings together the world's top early-career researchers
- Honourable mention award in CUI 2019
- Student travel grant from ICRA 2018, IROS 2018, NAACL-HLT 2019
- High honor certificates from Middle East Technical University (Spring 2014-2015, Fall 2014-2015, Spring 2013-2014, Fall 2013-2014)
- Honor certificate from Middle East Technical University (Spring 2012-2013)

SERVICES AND VOLUNTEERING

Organization Committee

- Workshop on Explainability for Human-Robot Collaboration, International Conference on Human-Robot Interaction (HRI), 2024 (under review)
- Workshop on Semantic Scene Understanding for Human-Robot Interaction, International Conference on Human-Robot Interaction (HRI), 2023
- Workshop on HRI for Explainable Robotics, International Conference on Robot & Human Interactive Communication (RO-MAN), 2023
- RSS Pioneers Workshop, Robotics: Science and Systems (RSS), 2022

Program Committee

- Towards Autonomous Robotic Systems Conference, (TAROS) 2021
- Workshop on Spatial Language Understanding and Grounded Communication for Robotics (SpLU-RoboNLP), 2021 and 2023

Journal Article Referee

- Frontiers in Robotics and AI
- IEEE Robotics and Automation Letters (RA-L)
- Autonomous Robots (AURO)
- User Modeling and User-Adapted Interaction (UMUAI)

Conference Paper Referee

- Robotics: Science and Systems (RSS)
- Conference on Robot Learning (CoRL)
- International Conference on Robotics and Automation (ICRA)
- ACM/IEEE Conference on Human-Robot Interaction (HRI)
- International Conference on Intelligent Robots and Systems (IROS)
- Signal Processing and Communication Application Conference (SIU)
- Turkey Robotics Conference (ToRK)

Student Volunteer

- ACM/IEEE International Conference on Human-Robot Interaction (HRI 2022)
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2018)

SELECTED OUTREACH

Robotics demonstrations and presentations of current research

- Swedish Foundation for Strategic Research (SSF), 2023
- KTH School of Electrical Engineering and Computer Science Lab Tours, 2023
- Atlanta Science Festival, Georgia Tech Science and Engineering Day, 2022
- Sveriges Television (SVT), 2020
- The Minister for Higher Education and Research (Matilda Ernkrans), 2019
- Robots Exhibition at the Tekniska Museum, 2019
- Giants event for female and non-binary high school students, 2018
- European Researchers' Night event for high school students, 2016

EXTRA-CURRICULAR ACTIVITIES

- Theater (played in private theaters for 8 years and 5 plays)
- Computer Engineers' Association (a sub-unit of Turkish Engineers' and Architects' Association) board member, 2016-2018
- Student Delegate Committee member at Middle East Technical University, 2010-2011