FETHİYE IRMAK DOĞAN

Postdoctoral Researcher
KTH Royal Institute of Technology, SWEDEN
⌂ irmakdogan.com   ✉ fidogan@kth.se

OBJECTIVE

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

AREAS OF INTEREST

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

EDUCATION

Ph.D., Division of Robotics, Perception, and Learning, KTH Royal Institute of Technology　　　01.2018-03.2023
- Thesis on *Robots That Understand Natural Language Instructions and Resolve Ambiguities*

M.Sc., Computer Engineering, Middle East Technical University　　09.2015-12.2017
- Thesis on *Hierarchical Incremental Context Modeling on Robots*
- Graduated with High Honor degree - CGPA : 3.93/4.00

B.Sc., 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
- Working on different follow-up clarification techniques to resolve ambiguities (sourced from semantic or visual uncertainties) in user instructions

Doctoral researcher at the Division of Robotics, Perception and Learning, KTH Royal Institute of Technology, SWEDEN　　01.2018-03.2023
- Working on generation and comprehension of referring expressions (i.e., the expressions describing objects with their distinguishing features) to understand user instructions and resolve ambiguities, 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) among many qualified applicants from 118 countries 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 that converses coherently and engagingly with humans on popular topics, supervised by Gabriel Skantze

Researcher at KOVAN Robotics Research Lab, Department of Computer Engineering, Middle East Technical University, TURKEY　　09.2015-12.2017
- Incremental context modeling for robots to make them capable of adapting to challenging real-world environments, supervised by Sinan Kalkan
- A side project to determine the health status of patients in a fuzzy manner using verbal interaction and sensory data

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 and generating some filters to make the data interpretable for neuroscientists, 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 and programming Nao to perform a traditional dance, supervised by Sinan Kalkan

Part time software developer at Özgür Yazılım Company, TURKEY 02.2013-06.2013
  – Taking a role in the development of 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 Department of Computer Engineering, 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, and Rasmus Rudling
  – High School Intern: Erik Eriksson

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

SCIENTIFIC CONTRIBUTIONS   *Journal Articles*
  – **F. I. Doğan**, W. Liu, I. Leite, and S. Chernova, 'Semantically-Driven Disambiguation for Human-Robot Interaction,' *Robotics and Automation Letters (RAL)*, (Under review).
  – **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.
  – **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
  – **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.
  – M. Iovino, **F. I. Doğan**, I. Leite, and C. Smith, 'Interactive Disambiguation for Behavior Tree Execution,' *International Conference on Humanoid Robots (Humanoids)*, 2022.
  – 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.
  – **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.
  – 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.

- **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.
- **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.
- **F. I. Doğan**, H. Çelikkanat, and S. Kalkan, 'Robotlarda Bağlamın Derin Artırımlı Boltzmann Makineleri ile Modellenmesi,' *Turkey Robotics Conference (ToRK)*, 2018. (written in Turkish)
- **F. I. Doğan**, S. Kalkan, 'Bağlamın Hiyerarşik Doğası,' *Turkey Robotics Conference (ToRK)*, 2016. (written in Turkish)
- 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
- 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.
- 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
- E. Bartoli, **F. I. Doğan**, and I. Leite, 'Contextualized Knowledge Graph Embeddings for Activity Prediction in Service Robotics,' *Workshop on Semantic Scene Understading for Human-Robot Interation, HRI*, 2023.
- **F. I. Doğan**, 'Social Robots That Understand Natural Language Instructions and Resolve Ambiguities,' *RSS Pioneers Workshop, RSS*, 2021.
- 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.
- **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.
- **F. I. Doğan**, H. Çelikkanat, I. Bozcan, and S. Kalkan, 'Learning to Increment A Contextual Model,' *Workshop on Continual Learning, NeurIPS*, 2018.

Technical Reports
- 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.
- **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 Tech, 2021
- Image Lab, Department of Computer Engineering, Middle East Technical University, 2021

---

* Equal Contribution

System Demonstration
  – Invited demo on SIGDIAL 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 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 Intelligent Robots and Systems (IROS)
  – ACM/IEEE Conference on Human-Robot Interaction (HRI)
  – 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
  – 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