

# Ekin Akyürek

COMPUTER SCIENCE & ARTIFICIAL INTELLIGENCE LABORATORY, MIT

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## Education

### Massachusetts Institute of Technology

Cambridge, MA

PH.D. STUDENT IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Sept 2019 - Present

- Advisor: Prof. Jacob Andreas
- GPA: 5.00/5.00
- Related Classes: Algorithms for Inference (6.438), Statistical Learning Theory (9.520), Theory of Computation (6.840), Advanced NLP (6.864), Neuro-Symbolic Models for NLP, Optimization Methods (6.255)

### Koç University

İstanbul, TR

B.S. IN ELECTRICAL AND ELECTRONICS ENGINEERING; B.S IN PHYSICS

Sept 2013 - Feb 2019

- Research Advisor: Prof. Deniz Yuret
- Summa Cum Laude; 2nd rank in the University; 1st rank in the Physics Department
- GPA: 4.07/4.30
- Related Classes: Linear Systems Theory, Deep Learning, Random Process, Digital Image and Video Processing, Digital Signal Processing

### Izmir Science High School

İzmir, TR

- Won a bronze medal in International Physics Olympiad in 2013

Sept 2009 - Feb 2013

## Publications

- [1] E. Akyürek, A. F. Akyürek, and J. Andreas, “Learning to Recombine and Resample Data For Compositional Generalization”, *Preprint*, 2020.
- [2] E. Akyürek, E. Dayanık, and D. Yuret, “Morphological Analysis Using a Sequence Decoder”, *Transactions of the Association for Computational Linguistics*, vol. 7, 2019.
- [3] A. Börütecene, I. Bostan, E. Akyürek, A. Sabuncuoğlu, I. Temuzkusu, Ç. Genç, T. Göksun, and O. Özcan, “Through the glance mug: A familiar artefact to support opportunistic search in meetings”, in *Proceedings of the Twelfth International Conference on Tangible, Embedded, and Embodied Interaction*, ACM, 2018.

## Honors & Awards

### INTERNATIONAL

- |      |  |                |
|------|--|----------------|
| 2016 | <b>Regional Finalist</b> , Hult Prize                | London, UK     |
| 2013 | <b>Bronze Medal</b> , International Physics Olympiad | Copenhagen, DK |
| 2013 | <b>AP Scholar Award</b> , College Board              | U.S            |

### DOMESTIC

- |         |  |              |
|---------|--|--------------|
| 2018    | <b>Best Senior Design Project</b> , Koç University Electrical Engineering Department | İstanbul, TR |
| 2016    | <b>Best Design Award</b> , TUBITAK UAV Competition                                   | İstanbul, TR |
| 2016    | <b>2nd Place</b> , İstanbul Technical University Robotics Olympics                   | İstanbul, TR |
| 13'-19' | <b>Full-Merit Undergraduate Scholarship</b> , Koç University                         | İstanbul, TR |
| 13'-19' | <b>TUBITAK Undergraduate Scholarship</b> , TUBITAK                                   | Ankara, TR   |
| 2012    | <b>Gold Medal</b> , TUBITAK National Physics Olympiad                                | Ankara, TR   |

## Research Experience

### Computer Science & Artificial Intelligence Laboratory, MIT

Cambridge, MA

PHD STUDENT

Sept 2019 - Present

- My recent work aims at understanding finding simple biases that will enable compositional generalization in neural language models to achieve human-like generalization.
- Working on using language to guide few-shot learning of image classifiers and robot policies in multi agent settings.

## Computer Science & Artificial Intelligence Laboratory, MIT

Cambridge, MA

VISITING RESEARCHER

Jul. 2018 - June 2019

- Worked on linear algebraic formalization of automatic differentiation to enable matrix operations on the computation graph with Prof. Alan Edelman (a paper is in-print)
- Implemented [DPMM.jl](#), a modular Julia Library implementing distributed non-parametric Bayesian algorithms for efficient parallel inference in DPMMs (with John W. Fischer).
- Contributed to core Julia machine learning libraries including [KnetLayers.jl](#) and [Knet.jl](#)

## Artificial Intelligence Laboratory, Koç University

Istanbul, TR

RESEARCHER

July. 2017 - July 2018

- Developed new state-of-the-art neural models for morphological analysis and generation [2].
- Worked on visual-language grounding and implemented a state of the art Visual Q & A [model](#) on GQA dataset in Julia.

## Arçelik Research Center for Creative Industries, Koç University

Istanbul, TR

ELECTRONICS DESIGNER & SOFTWARE ENGINEER

Sept 2016 - July 2017

- Designed and programmed a prototype of interactive mug with speech recognition and artificial intelligence capabilities [3].

## Work Experience

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### Aselsan

Ankara, TR

DIGITAL DESIGN ENGINEER INTERN

June 2017 - July 2017

- Designed an interface on the FPGA board which drives specific IC circuits which are used in wireless communication.

### Balfis

Austin, TX

SOFTWARE DEVELOPER INTERN

June 2016 - August 2016

- Designed a Django web server for the company's cross-platform mobile application
- Coded server-side communication part of the application, written in Ionic framework

### Molocate

Istanbul, TR

FULL-STACK DEVELOPER

January 2016 - August 2016

- Created the UI of the IOS application that enable users to share videos with location tagging and view videos from followed locations and users.
- Added back-end communication functionality to the front-end application written in the Swift language.

## Skills

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**Programming** Python, Julia, Java, MATLAB, C++, JavaScript, Swift, PHP, Ionic

**Electronics** DSP, SPICE, PCB Design, VHDL Design, Microcontrollers

## Teaching Experience

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2016 **Tutor**, Electromagnetism, Koc University

Istanbul, TR

2016 **Tutor**, Circuit Design, Koç University

Istanbul, TR

15'-16' **Tutor**, Signal & Systems, Koç University

Istanbul, TR

14'-15' **Teaching Assistant**, Physics, TUBITAK Science Olympiad Summer and Winter Schools

Ankara, TR

## Volunteer Work

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### Make a Wish Turkey

Istanbul, TR

VOLUNTEER

2014-2017

- With a group of volunteering peers, we visited cities around the country to make the utmost dreams of the children with life threatening diseases. We raised funds and arranged events for children

### Koc University Education Society

Istanbul, TR

VOLUNTEERING TEACHER

2013-2014

- Gave free lectures for secondary school kids from families with low socio-economical status to support with their classes

## Leadership & Club Activities

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## **IEEE Robotics & Automation Society, IEEE Student Branch**

*Istanbul, TR*

CHAIRMAN

*July 2015 - June 2016*

- Hold 5-week Arduino & Electronics Design Courses for the freshman engineering majors in the Koç University
- Arranged 5-week Raspberry Pi Development Courses given by a Microsoft MVP which provided students with internship opportunities at Microsoft
- Organized Techno-Date which brings together students and tech startups. During the event students had the chance to listen-up numerous start-up journeys
- Completed two projects with the team and appointed to local awards (Drone.NET and KUAV)

## **IEEE Student Branch**

*Istanbul, TR*

BOARD MEMBER

*Sept 2014 - June 2018*

- Organized 12th IEEE Turkey Student & Young Professional Congress in 2015 with 400 IEEE members in Koç University
- Organized “Bi’ Fikir Bi’ Şirket” which is a 2-day comprehensive event for students interested in technology enterprises and startups, including seminars, workshops and entertainment. The event also comprises a competition for startups to receive support from Koc Incubation Center