YEN-LING KUO

32 Vassar St. Room G482,
Cambridge, MA 02139

+1-206-430-8208
ylkuo@mit.edu
http://yenlingkuo.com

EDUCATION

2016/09 – Present **Massachusetts Institute of Technology**, Cambridge, MA
Ph.D. Candidate in Electrical Engineering and Computer Science, minor in Cognitive Science

2009/09 – 2012/01 **National Taiwan University**, Taipei, Taiwan
M.S. in Computer Science and Information Engineering (CSIE)
- Thesis: A Multiagent Reasoning System for Commonsense Knowledge Integration

2011/09 – 2011/12 **Massachusetts Institute of Technology**, Cambridge, MA
Visiting Student in Media Arts and Sciences

2005/09 – 2009/06 **National Taiwan University**, Taipei, Taiwan
B.S. in Computer Science and Information Engineering, minor in Physics

RESEARCH EXPERIENCE

2016/09 – Present **InfoLab, MIT CSAIL** Advisor: Dr. Boris Katz
- **Planning with Deep Compositional Models**: Creating a motion planner which integrates sequence models and planning algorithms to extend robots' capabilities to follow commands, plan in dynamic environments, and plan in the presence of other agents. [1, 2]
- **Inverse Planning and Tool Use**: Developing experiments and computational models to understand how humans use tools and understand other agent's actions and intents.
- **Interpreting and Explaining Model Decisions and Failures**: Developing methods to interpret robots' internal states. Creating a dataset of car accident scenes and building algorithms to explain a reinforcement learning agent's decisions to correct these accidents.

2011/09 – 2011/12 **Software Agent Group, MIT Media Lab** Advisor: Dr. Henry Lieberman
- **Language Explorer**: Created a mobile language learning app that adapts to a learner's context and capability by leveraging ConceptNet and Foursquare to automatically arrange materials and generate dialogues.
- **ConceptNet 5**: Participated in the early design and implementation of the multilingual knowledge base to integrate data from Chinese ConceptNet, ReVerb, and GoalNet.

2008/06 – 2012/01 **Intelligent Agents Lab**, **NTU CSIE** Advisor: Prof. Jane Yung-jen Hsu
- **Multi-agent Reasoning System**: Built a multi-agent system to provide commonsense reasoning results from multiple knowledge bases for application developers to use. [3]
- **Crowdsourcing of Chinese Commonsense Knowledge**: Created human computation games on social platforms and designed analogical reasoning algorithms to build the largest Chinese commonsense knowledge base (over one million sentences) in the world. The collected data is contributed to MIT Open Mind Common Sense project. [4, 5]

WORK EXPERIENCE

2017, 2018, 2019 August — **Teaching Assistant**, *Marine Biology Lab* — Woods Hole, MA

- Course: *Brains, Minds, and Machines Summer Course*
- Taught Deep Learning and Reinforcement Learning tutorials.
- Supervised student projects, including human plan understanding, multi-agent communication and coordination, better tracing for bio-inspired drones, social interaction recognition from videos, and composition of policies to form complex behaviors.

2018/09 – 2018/12 **Teaching Assistant**, *Massachusetts Institute of Technology* — Cambridge, MA

- Course: *Aspects of a Computational Theory of Intelligence*
- Reviewed, provided feedback, and graded student projects. Held weekly office hours to discuss and answer students' questions.

2012/10 – 2016/08 **Software Engineer**, *Google Inc.* — Mountain View, CA

- Tech Lead for Shop the Look feature, which integrates outfit search and visually similar items to Google search. (*posts on Google AdWords blog and TechCrunch*)
- Developed advanced shopping search features for shopping queries on different platforms.
- Developed machine learning algorithms and crowd-sourcing infrastructure to extract product attributes from image content and product metadata.

2011/06 – 2011/08 **Software Engineering Intern**, *Google Inc.* — Kirkland, WA

- Developed algorithms and pipeline to automatically build entity attribute comparison table for any entity using large-scale crawled web data.
- Won **Third Place** in Google Kirkland intern project showcase among 20+ interns.

2010/02 – 2011/05 **Teaching Assistant**, *National Taiwan University* — Taipei, Taiwan

- Courses: *Artificial Intelligence*, *Advanced Artificial Intelligence*
- Held weekly TA hours to discuss class, homework, and term projects with students.
- In charge of both written and programming assignments for over 100 students.

SELECTED PUBLICATIONS

[1] **Yen-Ling Kuo**, Andrei Barbu, and Boris Katz. Deep compositional robotic planners that follow natural language commands. In *review*.

[2] **Yen-Ling Kuo**, Andrei Barbu, and Boris Katz. Deep Sequential Models for Sampling-based planning. In *Proceeding of 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems* (*IROS-2018*), October 2018. (*pdf*)

[3] **Yen-Ling Kuo** and Jane Yung-jen Hsu. Planning for Reasoning with Multiple Common Sense Knowledge Bases. *ACM Transactions on Interactive Intelligent Systems (TiiS-2012), Vol. 2, No. 3, Article 17, pp. 1-24*, September 2012. (*pdf*)

[4] **Yen-Ling Kuo** and Jane Yung-jen Hsu. Resource-bounded Crowd-sourcing of Commonsense Knowledge. In *Proceeding of the 22nd International Joint Conference on Artificial Intelligence* (*IJCAI-2011*), July 2011. (*pdf*)

[5] **Yen-Ling Kuo**, Kai-yang Chiang, Cheng-wei Chan, Jong-Chuan Lee, Rex Wang, Edward Shen, and Jane Yung-jen Hsu. Community-based Game Design: Experiments on Social Games for Commonsense Data Collection. In *Proceeding of 2009 KDD Workshop on Human Computation* (*HCOMP-2009*), June 2009. (*pdf*)

SELECTED PROJECTS

2016/10 - Present **ScienceVR: Science Experiments in VR**

Developing an environment that allows users to perform science experiments in virtual reality. With real-time physics simulation, users can interact with virtual magnets and coils and see the visualization of the simulated magnetic fields (*demo video*, more on *http://sciencevr.com*).

- Finalist of 2016 AT&T AR/VR Challenge.
- Was invited to the VR Screening in Marche Du Film, Cannes Film Festival, in 2017.
- Is funded by MIT Sandbox Innovation Fund.

2013/01 – Present **MovISee: Timeline-based Visualization with Body Movement**

Developing a digital platform that uses information from depth camera to create mixed reality for people to explore the selected digital files and transform their body movements to customized visual outputs. Demos available at *http://movisee.com*.

- Was invited to exhibit at "The Lab Project" in Camden Arts Centre and Kingsgate Studio, London, in 2015.
- Was invited to exhibit at "Manchester Science Festival", Manchester, UK, in 2016.

2010/04 – 2011/07 **Flora: Mobile Flower Image Recognition Service**

Developed an iPhone app that recognizes flower photos taken by general public to provide information of flowers in 2010 Taipei International Flora Exposition (*demo video*).

- Winner of **2010 Hinet Telesoft Competition** and **8th YuShow Cup Creativity Award**.

HONORS & AWARDS

2019 **Top 10%,** *ICFP Programming Contest 2019*

2018 **CBMM Siemens Graduate Fellowship,** *Siemens Healthineers*

2016 **MIT Greater China Computer Science Fellowship,** *Massachusetts Institute of Technology*

2016 **Finalist,** *AT&T AR/VR Challenge*
Invited to demo at 2017 AT&T developer summit in Las Vegas among 67 submissions.

2012 **Best Master Thesis Award**, *Taiwanese Association of Artificial Intelligence* (*TAAI*)
Awarded annually to three master students for Best Thesis in AI research among all universities in Taiwan.

2011 **Irving T. Ho Memorial Scholarship**, *Irving T. Ho Memorial Foundation*
Awarded annually to one EE/CSIE graduate student with exceptional research performance who has been selected by NTU as an overseas exchange student.

2011 **Third Place**, *Google Kirkland Intern Project Showcase, Google Inc.*
Awarded to the top three intern projects among 20+ interns.

2011 **Google Anita Borg Memorial Scholarship**, *Google Inc.*
Awarded to female students with outstanding academic performance and leadership demonstration.

2011 **Gold Prize**, *8th YuShow Cup Creativity Award*, Taiwan
Awarded for Best Application in Technology and Design among 700+ projects across all universities.

2010 **First Place**, *2010 Hinet Telsoft Competition - Flora Expo Application Track*, Taiwan
Awarded for Best Application of Technology in Flora Expo among 600+ teams.

2010 **Outstanding Teaching Assistant Award**, *Department of CSIE, NTU*
Awarded to CSIE Teaching Assistants with highest ratings from students.

LEADERSHIP & ACTIVITIES

2018/06 – 2018/08 **Mentor**, *MIT Summer Research Program for Brain and Cognitive Science*

2018 **Mentor**, *MIT Undergraduate Women in EECS Buddy Program*

2017/06 – 2019/05 **SPTV Chair**, *MIT Sidney Pacific Graduate Residence*
- Developed and deployed features for Raspberry Pis across all floors in the building.

2016/08 **Student,** *Brains, Minds, and Machines Summer Course (admitted 30 students)*

2015/10 **Participant & Google Interviewer**, *Grace Hopper Celebration of Women in Computing*

2014/10 – 2016/08 **Website Developer**, *San Francisco Bay Area Taiwan UXD Gathering*

2013/01 – 2016/09 **Tech Intern Mentor & Interviewer**, *Google Inc.*
- Weekly career discussion with mentees; hosted 1 PhD and 6 undergraduate interns.
- Conducted 80+ technical interviews to hire qualified engineers.

2011, 2013, 2019 **Reviewer** of *ACM IUI* (*Intelligent User Interface*) *2013, TAAI 2011, IJCAI 2019*

2007/07 – 2008/07 **President**, *AIESEC* (*International Association of Students in Economics and Management, http://aiesec.org*) *National Taiwan University Local Committee*
- Initiated an overseas internship program based on social issues for NTU students.
- Hosted a leadership development conference for 14 universities in Taiwan and Asia Pacific countries in June 2008.
- Led more than 100 members to win the 2007-2008 **Best Local Committee Award**.

SKILLS

Programming Languages	C/C++, Python, Java, JavaScript, PHP, C#
Tools and Libraries	NLTK, OpenCV, OpenGL, Matlab, Robot Operating System, Processing, Unreal, Unity, Max/MSP
Hardware Platforms	Kinect, Raspberry Pi, Arduino