Shiran Dudy

PERSONAL INFORMATION

Address   **Cambridge, Massachusetts**
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RESEARCH INTERESTS

Broadly focusing on augmenting humans

- <u>NLP</u>: conversational systems, personalization, speller systems.
- <u>Informational Retrieval:</u> search engines, retrieval based LM
- <u>Speech</u>: speaker verification, speech recognition
- <u>HCI</u>: user/community-centered design, Wizard of Oz, participatory design.
- <u>Focus values</u>: fairness, safety, user agency, transparency, participation

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EDUCATION

2023-present   **Research Scientist in Responsible AI**
Work on technical and socio-technical research.
"Northeastern University", Boston, MA, USA
My main interest is to promote fairness and equitable technology. My projects revolve around studying and improving current algorithmic biases, design biases, and stakeholder engagements. Technically, I work on LM/LLMs, as well as search engines. Socio technically, I research on participatory design methods in a community based research to promote equitable decision making.

2021-2023   **Research Associate in Human-Computer interaction**
Focus on speech, dialogue systems, responsible AI design.
"University of Colorado, Boulder" (CU Boulder), Boulder, CO, USA
Participate in the institute for student AI teaming (iSAT) project.
I research and develop a conversational partner to promote equitable and respectful human-human collaborations. Leading the interruption detection project, and equity oriented intent schema project. The goal is to promote improved learning environments for students.

2013-2020   **Ph.D. in Computer Science**
Focus on NLP, accessibility, and fairness.
"Oregon Health and Science University" (OHSU), Portland, OR, USA
Participate in Brain-Computer Interface (BCI) accessibility project at CAMBI. I developed language models, and investigated their biases (FST, transformers) with icons, letters, or word symbol sets. The project's goal is to facilitate locked-in individuals of various literacy levels to communicate with their environment.

2012-2008   **B.Sc. in Biomedical Engineering**
Focused on speech signal processing, accessibility
"Ben Gurion University" (BGU), Israel
Final project made in signal processing field where I conducted a feasibility test for a Text To Speech system (TTS) for the Hebrew language for visually impaired Hebrew speakers.

SELECTED PUBLICATIONS

"**Bridging the language gap: taxonomy for conversational systems**", Shiran Dudy, Joewie J. Koh, Abteen Ebrahimi, Alessandro Roncone, Katharina Kann, and Verena Rieser, under submission to LREC-COLING.

"**Dependency Dialogue Acts--Annotation Scheme and Case Study**", Jon Z Cai, Brendan King, Margaret Perkoff, Shiran Dudy, Jie Cao, Marie Grace, Natalia Wojarnik, Ananya Ganesh, James H Martin, Martha Palmer, Marilyn Walker, and Jeffrey Flanigan, International Workshop on Spoken Dialogue Systems Technology, 2023

"**The Dimensions of Reflection Coding Scheme: A New Tool for Measuring the Impact of Designing for Reflection in Early Childhood**", Layne Jackson Hubbard, Norielle Adricula, Chelsea Brown, E Margaret Perkoff, Shiran Dudy, Eliana Colunga, and Tom Yeh, Conference on Creativity and Cognition, 2023

"**Expansive Participatory AI: Supporting Dreaming within Inequitable Institutions**", Shiran Dudy* and Michael A. Chang* (equal contribution), Human-Centered AI workshop (HCAI), Neural Information Processing Systems (NEURIPS), 2022.

"**Open-domain Dialogue Generation: What we Can Do, Cannot do, and Should Do Next**", Katharina Kann, Abteen Ebrahimi, Joewie J. Koh, Shiran Dudy, and Alessandro Roncone, Association for Computational Linguistics (ACL), ConvAI workshop, 2022.

"**Refocusing on Relevance: Personalization in NLG**", S. Dudy, S. Bedrick, and B. Webber, Empirical Methods in Natural Language Processing (EMNLP), Punta Cana, 2021.

"**Are Some Words Worth More Than Others**", S. Dudy, S. Bedrick, Empirical Methods in Natural Language Processing (EMNLP), Eval4NLP workshop, online, 2020. Won 2nd place award

"**Long-Tail Predictions with Continuous-Output Language Models**", S. Dudy, S. Bedrick, Association for Computational Linguistics (ACL), WiNLP workshop, Seattle, 2020.

"**BciPy: Brain-Computer Interface Software in Python**", T. Memmott, A. Koçanaoğulları, M. Lawhead, D. Klee, S. Dudy, M. Fried-Oken, B. Oken, arxiv, 2020

"**Noisy Neural Language Modeling for Typing Prediction in BCI Communication**", R. Dong, D. Smith, S. Dudy, S. Bedrick, Association for Computational Linguistics (NAACL), SPLAT workshop, Minineapolis, 2018.

"**Effects of simulated visual acuity and ocular motility impairments on SSVEP brain-computer interface performance: an experiment with Shuffle Speller**", B. Peters, M. Higger, F. Quivira, S. Bedrick, S. Dudy, B. Eddy, M. Kinsella, T. Memmott, J. Wiedrick, M. Fried-Oken, D. Erdogmus, B. Oken, Brain-Computer Interfaces journal, 2018

"**Compositional Language Modeling for Icon-Based Augmentative and Alternative Communication**", S. Dudy, S. Bedrick, Association for Computational Linguistics (ACL), DeepLo workshop, Melbourne, 2018.

"A Multi-Context Character Prediction Model for a Brain-Computer Interface", S. Dudy, S. Xu, S. Bedrick, D. Smith, North American Association for Computational Linguistics (NAACL), SCLeM workshop, New Orleans, 2018.

"Automatic Analysis of Pronunciations for Children with Speech Sound Disorders", S. Dudy, S. Bedrick, M. Asgari, and A. Kain, Computer Speech and Langauge (CSL) journal, 2018

"OHSU @ MediaEval: Adapting Textual Techniques to Multimedia Search", S. Dudy, S. Bedrick, MediaEval Benchmarking Initiative for Multimedia Evaluation (IEEE satellite event), Wurzen, 2015

"Pronunciation Analysis for Children with Speech Sound Disorders", S. Dudy, M. Asgari, and A. Kain, IEEE Engineering in Medicine and Biology society (EMBC), Milan, 2015

"Phonetic Search in a New Target Language Using Multi Language Indexing and Phonetic Mappings", In Proceedings 2013 Speech Processing Conference, Tel Aviv, 2013

ACADEMIC QUALIFICATIONS

2017   **Teaching Assistant**
"Introduction to Deep Learning", Professor Meysam Asgari
Included homework preparation and grading, and demos. (OHSU)

2016   **Teaching Assistant**
"Analyzing Sequences", Professor Stephen Wu
Included homework preparation and grading. (OHSU)

2013   **Signal Processing Researcher**
Afeka Center for Language Processing (ACLP), Professor Ami Moyal
Participate in 2 researches on key-word spotting.

2012-2013   **Research Assistant**
Speech and Signal Processing Lab, Professor Sharon Gannot.
The lab focuses on the study of speech and acoustics. Participated in a research to develop a de-reverberated signal to enhance speech recognition performance.
"Bar Ilan University" (BIU)

2011-2012   **Teaching Assistant**
"Introduction to Stochastic Processes", Professor Maoz Shamir.
Included lesson plan, frontal instruction and grading. (BGU)

2009-2010   **Research Assistant**
Computational Motor Lab, Professor Amir Karniel
The lab focuses on the study of human motor control and biomechanics. Participated in the "handshake experiment," based on Turing test theory. (BGU)

WORK EXPERIENCE

2016   **Cylance Inc.** (Summer internship)
Worked as a deep learning engineer in data science team.
Implemented deep learning architectures to detect malware.

2015   **Sensory Inc.** (Summer internship)
Worked as a speech processing engineer. Integrated trigger-based speaker verfication process, incorporated new elements to the process and estimated optimal model parameters. Worked on a user defined process to employ a digit sequence task.

2012   **Vocal-Zoom** (Start-Up company)

Worked as a signal processing engineer. Their mission is to enable communication and speech recognition, especially in noisy environments.

2011-2012   **Vectorious Medtech** (Start-Up company)
Worked as a research and development engineer. Their mission is to develop a monitoring device for Congestive Heart Failure patients.

PC SKILLS

Languages:	Python, R, Ruby, Matlab, TCL, Cython, C++, Bash/Shell, Cygwin
Task Mngmnt:	SLURM, Hadoop, MPI, Condor, Spark
OS:	Linux, OSX, Windows, Docker (VM)
ASR Tools:	HTK, Kaldi, Openfst
Search engine:	Lucene
Python Tools:	PyTorch, TesorFlow, HuggingFace, virtualenv, spcay, nltk
Paper related:	Latex, Bibtex, vim
Version Control:	Git (repos on github, docker hub)
Cloud Service:	Amazon EC2, Amazon Route 53 (DNS service)

HCI skills

Experiment design. Human subject experiment (including leading an IRB project)
Applying mixed methods:
1) Qualitative: semi structured interviews, surveys
2) Quantitative: data analysis

Workshops

Organized the second NLPerspectives workshop, hosted by CEUR-WS, 2023

Organized "Interdisciplinary Approaches to Getting AI Experts and Education Stakeholders Talking", Hosted at AIED, 2022

TALKS

Value based research, Cigna inc., 2023

UserNLP workshop (The World Wide Web Conference), Personalization in NLG, 2022

NLP class at CU Boulder, guest speaker to discuss "Responsible Dialogue Systems", 2021

The Hebrew University, invited talk, "Overcoming Limitations of Categorical Neural Language Models", 2021

Allen Institute for AI, invited talk, "Overcoming Limitations of Categorical Neural Language Models", 2020

Chang lab, UCSF-Berkeley, invited talk, "a proposal for language model approaches in Ecog based AAC", 2020

Bar Ilan University, invited talk, "Language Models in supportive AAC", 2019

Women Who Code, Women in Data Science Series, "Language Models in BCI systems", Portland, 2019

BCI Meeting, Natural Language Processing Workshop, "Towards Icon Language Models", Asilomar, 2018

AWARDS

Community outreach grant, planed a robotics camp for middle school students, 2022
WiML@ICML award recipient to attend WiML and ICML, 2020
WiNLP Diversity and Inclusion award recipient to attend WiNLP and ACL, 2020
WiML@ICLR award recipient to attend ICLR, 2020
Student Research Workshop (SRW) travel award to attend ACL, 2018
Graduate Student Organization (GSO) at OHSU travel award to attend NAACL, 2018
GREPSEC cybersecurity workshop scholarship, 2017
38th Security and Privacy Symposium student travel award, 2017

LANGUAGES	English (high fluency level) Hebrew (native speaker) Arabic (basic level)
PERSONAL SKILLS	Good human interaction skills Good in planning and meeting objectives Know how to work under pressure Well organized and responsible