

Invited Talk: From Foundational Models to Embodied Intelligence

Jana Kosecka, PhD

Professor, Computer Science Department, George Mason University

Abstract

Advancements in reliable deployment of embodied agents rests to a large extent on robust, efficient and scalable semantic understanding of the surrounding environment. Obtaining semantic representations from images and video has been propelled in the past by supervised deep learning techniques and large amounts of labelled data. I will discuss approaches to object detection, pose recovery and detailed semantic parsing using deep convolutional neural networks (CNNs). Recent advances in self-supervised and weakly supervised learning and advent of large-scale vision-and-language models (VLMs) open new avenues for learning semantic representations and interacting with embodied agents. I will discuss both opportunities and challenges of these models and the integration of spatial and semantic representations with learning policies for elementary navigation tasks. The presented explorations open interesting avenues for control and decision making and general strategies for design and development of general-purpose embodied agents.

Biography

Jana Kosecka is Professor at the Department of Computer Science, George Mason University. She obtained Ph.D. in Computer Science from University of Pennsylvania. Following her PhD, she was a postdoctoral fellow at the EECS Department at University of California, Berkeley. She is the recipient of David Marr's prize and received the National Science Foundation CAREER Award. Jana is a chair of IEEE technical Committee of Robot Perception, Associate Editor of IEEE Robotics and Automation Letters and International Journal of Computer Vision, former editor of IEEE Transactions on Pattern Analysis and Machine Intelligence. She held visiting positions at Stanford University, Google and Nokia Research. She is a co-author of a monograph titled Invitation to 3D vision: From Images to Geometric Models. Her general research interests are in Computer Vision and Robotics. In particular, she is interested 'seeing' systems engaged in autonomous tasks, acquisition of static and dynamic models of environments by means of visual sensing and human-computer interaction.

Invited Talk: Large Language Models in Medicine and Healthcare

Yonghui Wu, PhD

Associate Professor, Department of Health Outcomes & Biomedical Informatics, University of Florida

Abstract

Large language models (LLMs) such as ChatGPT has good abilities in communicating with humans and generating textual content such as emails, articles, and even computer source codes, approaching human-like language processing. LLMs bring substantial opportunities and challenges for artificial intelligence (AI) in healthcare. Based on the experience in developing and applying LLMs (e.g., GatorTron and GatorTronGPT) in the clinical domain, this talk will overview the recent progress of LLMs, identify opportunities in using LLMs for intelligent electronic health record systems and better healthcare, and examine potential risks, bias, and disparities of this disruptive AI technology.

Biography

Dr. Wu is an Associate Professor with Tenure in the Department of Health Outcomes and Biomedical Informatics at the University of Florida (UF) College of Medicine. He also serves as the Director of Natural Language Processing (NLP) at UF Clinical and Translational Science Institute (CTSI) and OneFlorida+ Clinical Research Consortium. Dr. Wu's primary research interests include clinical NLP, machine learning, and Electronic Health Record (EHR) based drug repurposing. He has worked on various challenging clinical NLP topics including large language models, prompt-based learning, text generation, patient information extraction, NLP-powered computable phenotyping, disease predictive modeling, and many other artificial intelligence (AI) applications in the medical domain. His work was supported by funding from the National Institutes of Health (NIH), Patient-Centered Outcomes Research Institute (PCORI), and Centers for Disease Control and Prevention (CDC).

Panel: Societal Impact of Large-Scale Models in Natural Language Processing

This panel focuses on natural language processing (NLP), especially large language models (LLMs) such as GPT and BERT, and how recent developments impact various aspects of society including law practice, medicine, health, and IT industry. NLP gained extensive attention recently, especially with the emergence of ChatGPT and other AI conversational agents alike. The panel will offer diverse opinions on the effects these AI systems have on our society, through the eyes of experts from different backgrounds and domains of activity.

Moderator:

Dr. Xudong Liu, Associate Professor at the School of Computing, University of North Florida. Dr. Liu's research agenda mostly has been about solving both theoretical and practical problems on decision making, using tools and methods found in artificial intelligence, computational social science, and computational complexity theory. His research results has been published in premier conferences and journals such as AAAI, IJCAI and AMAI. His has an Erdős number of 3. He is an ACM member, and the founder and director of the UNF Artificial Intelligence Lab (UNFAIL).

Panelists:

Matt Berseth is the co-founder and CIO of NLP Logix, a leading AI services company. Matt is an AI and data science subject matter expert, who is a member of the Forbes Technology Council; he also led a TEDx talk in 2022, by the title of "Why Artificial Intelligence is More Human Than You Think." Matt holds both a Bachelor of Science and a Master of Science in Computer Science, from North Dakota State University. Matt holds adjunct faculty positions at both the University of North Florida and Jacksonville University, where he teaches data science. He serves on the advisory board for the Florida Data Science for Social Good non-profit and is also on the computing advisory board for the University of North Florida. He and his wife Katie have been married for over 15 years, have three children, and reside in Ponte Vedra Beach, Florida.

Dr. Vikash Gupta is an Assistant Professor in the Department of Radiology at Mayo Clinic in Jacksonville, Florida at the Center for Augmented Intelligence in Imaging. With a rich academic background and a Ph.D. in Computational Biology from INRIA, France, Dr. Gupta has cultivated expertise at the intersection of medical imaging, imaging informatics, data science, and computational biology. Dr. Gupta worked as a Research Scientist at The Ohio State University and a Postdoctoral Researcher at the University of Southern California's Imaging Genetics Center, where he worked on building AI tools for Breast Imaging, Image Superresolution, and Diffusion Tensor Imaging for the brain. He serves as a reviewer for several Journals and Conferences like MICCAI, ISBI, Transactions on Medical Imaging and Medical Image Analysis. He is an Associate Editor for Journal for Imaging Informatics in Medicine. He is an active contributor to open source efforts like MONAI (Medical Open Network for Artificial Intelligence) and SIIM Hackathons.

Trace Jackson is the Intellectual Property and Technology Law attorney for Rogers Towers, Jacksonville's oldest and most prestigious law firm. Trace serves on legal technology committees for his firm and for the Jacksonville Bar Association, and is licensed to practice before the USPTO. Trace is Jacksonville's premier technology law expert in Generative AI law, bringing decades of expertise and passion for

technology, science, and applied mathematics to the greater Northeast Florida legal community. For just under a decade, Trace has advised finance industry-leading corporations, fintech start-ups, chefs, inventors, religious gurus, local charities, artists, and small businesses in local, national, and global markets. Trace earned his JD from the University of Florida's Levin College of law, earning 12 book awards and serving as Editor in Chief of the UF Law Review. Prior to pursuing his JD, Trace earned his Masters in Applied Mathematics and Computational Physics from Northwestern University. This intersection of science, technology, and law, as well as a commitment to life-long learning, drives every day of his practice.

Dr. Yonghui Wu is an Associate Professor with Tenure in the Department of Health Outcomes and Biomedical Informatics at the University of Florida (UF) College of Medicine. He also serves as the Director of Natural Language Processing (NLP) at UF Clinical and Translational Science Institute (CTSI) and OneFlorida+ Clinical Research Consortium. Dr. Wu's primary research interests include clinical NLP, machine learning, and Electronic Health Record (EHR) based drug repurposing. He has worked on various challenging clinical NLP topics including large language models, prompt-based learning, text generation, patient information extraction, NLP-powered computable phenotyping, disease predictive modeling, and many other artificial intelligence (AI) applications in the medical domain. His work was supported by funding from the National Institutes of Health (NIH), Patient-Centered Outcomes Research Institute (PCORI), and Centers for Disease Control and Prevention (CDC).