Richard Magnotti

110 Frelinghuysen Road Piscataway NJ 08854-8019

richard.magnotti@rutgers.edu https://github.com/R-Magnotti

Research Interests and Expertise

Areas: Natural language processing, Planning and plan recognition, Human-robot interaction

Topics: Dialogue systems, Socially cognizant robots, Multi-modal interaction, Strategies for establishing common ground

Education

Rutgers University **Sep. 2021 – Present**

PhD Computer Science

PhD Advisor: Matthew Stone *New Brunswick, NJ*

Expected Graduation: 2026

University of Rochester **Sep. 2019 – May 2021**

MS Computer Science *Rochester, NY*

Southern CT State University (SCSU) **Sep. 2012 – Dec. 2017**

BS Physics

Honors Thesis: Finding and Analyzing Λ *and anti-*Λ *from Gold Nuclei Collisions at RHIC* *New Haven, CT*

Publications

Development of a Socially Cognizant Robotic Campus Guide

(Published at **2024 ACM/IEEE International Conference on Human-Robot Interaction, HRI 2024**)

(Authors: Benjamin Greenberg, Daniel Nakhimovich, **Richard Magnotti**, Hriday Purohit, Sanskar Shah, Aniket Satish Kulkarni, Uriel Gonzalez-Bravo, Noah R. Carver)

An Integrated Architecture for Common Ground in Collaboration

(Published at **The Tenth Annual Conference on Advances in Cognitive Systems, ACS 2022**)

(Authors: Dr. Christopher Geib, Denson George, Baber Khalid, **Richard Magnotti**, Prof. Matthew Stone)

Selected Talks

Rutgers Byrne Seminar Guest Lecture: "Natural Language Processing and Robotics", 2024

SOCRATES Seminar Talk Series, and Rutgers Robotics Workshop 2023: "Building a Socially Cognizant Task-Oriented Bot Using Amazon's Alexa", 2023

SOCRATES Chalk Talk research presentation: "How to Design Socially Cognizant Reminders, and Why Plan Recognition is Key", 2022

Work Experience

Orolia (Spectracom) **May 2020 – Aug. 2020**

Computer Science Research Intern *Rochester, NY*

- Researched the efficacy of machine learning techniques for spoof and jam signal detection on GPS tracking devices.
- Used Kalman filtering to optimize local harmonic oscillator signals using **MATLAB**.

Research Projects

Amazon Alexa Prize TaskBot Challenge 2

Rutgers Team (Jan. 2023 - July 2023)

Lead Researcher/Team Leader (Advisors: Prof. Matthew Stone, Prof. Yongfeng Zhang)

- Wrote proposal and secured $250,000 grant for my team to research new conversational capabilities for Alexa.
- Developed and built a multimodal conversational agent using the Alexa architecture in Python.
- Explored how coherence-based discourse structures impact AI learning of communication strategy trade-offs.
- Analyzed collections of user logs to glean insights for enhancing system functionality.

A Framework for Improving Knowledge-Aware Commonsense Reasoning with Human Intelligence

Rochester HCI [ROCHCI], Inter.Play Lab - University of Rochester (Sep. 2019 - May 2021)

Student Research Assistant (Advisor: Prof. Zhen Bai)

- Co-led the design and implementation of of a 'human-in-the-loop' system, leveraging human feedback to improve the commonsense reasoning capabilities of the system.

Word-Role and Word-Sense Matching

Natural Language Processing Course, University of Rochester (May 2020)

Course Research Project (Advisor: Prof. James Allen)

- Led a team of four to develop and implement a **Python**-based algorithm automating the matching of word roles and senses across diverse text corpora, achieving an 80% accuracy compared to human-annotated ground truth.

Machine Learning Actor-Action Classification

Computer Vision Course, University of Rochester (May 2020)

Course Research Project (Advisor: Prof. Chenliang Xu)

- Developed a novel tri-layer convolutional neural network implementation in **PyTorch** for multi-label actor-action classification from the A2D video dataset.

Relevant Coursework

- Natural Language Processing
- Computational Linguistics
- Artificial Intelligence
- Socially Cognizant Robotic Design
- Philosophy of Communication
- Learning in Humans and Machines

Certifications

Certificate in Socially Cognizant Robotics (Organization: Rutgers SOCRATES NSF NRT)

Technical Skills

Python, Unix, PyTorch, NLTK, ScikitLearn, Spacy, Java, Deep Learning, Machine Learning, MATLAB, R, Selenium, C#, Bash, Windows Batch, Git

Scholarships and Awards

NSF National Research Traineeship Award **Sep. 2021 – Aug. 2023**

Two-year grant funding research on the integration of robotics and technology into society. *Rutgers University*

Grant title: "Socially Cognizant Robotics for a Technology Enhanced Society" (SOCRATES)

Master's Student Tuition Scholarship **Sep. 2019 – May 2021**

Merit based scholarship awarded to Master's students who demonstrate academic excellence. *University of Rochester*