Chanel F. Cheng

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EDUCATION:

Rochester Institute of Technology, Rochester, NY
Bachelor of Science in Computer Science; 3.99 GPA; Expected May 2024

Relevant Coursework:

Machine Learning, Biorobotics/Cybernetics, Introduction to Biological Physics, Project-Based Calculus I & II, Multivariable & Vector Calculus, Differential Equations, Probability and Statistics, Linear Algebra

Certificates and Awards:

RIT's Dean's List, Aug 2019 – Present
MIT Summer Research Program in Neuroscience Certificate, Aug 2023
Northeast Big Data Innovation Hub: Cybersecurity Student Research Award, Jan 2023
Biomedical Responsible Conduct of Research Certificate, Oct 2022
Cybersecurity Visiting Student Research Program Certificate, Jul 2022
The American Legion Scholastic Award, Aug 2020
RIT Presidential Scholarship, Aug 2019

RESEARCH EXPERIENCE:

MIT Summer Research Program Scholar, Jun 2023 – Present
MIT McGovern Institute, Cambridge, MA
- Modeled divisive normalization in the central auditory pathway using convolutional neural networks, working with cochleagrams of natural sounds.
- Learned normalization kernels replicated adaptation of biological neurons to ongoing stimuli but did not fully replicate two-tone suppression effect.
- Overfitting to training data is consistently reduced, leading to improved generalization to out-of-distribution sounds.

Cybersecurity Visiting Student Research Program Scholar, May 2022 – Jun 2023
RIT ESL Global Cybersecurity Institute, Rochester, NY
- Designed end-to-end continual learning models and data streams for

cyber threat assessment.
- Data homogenization and task-agnostic learning settings are explored, enabling the use of cross-organizational datasets.
- Active learning strategies further reduced amount of labeled data required to less than 3% of original datasets.

Air Force Research Lab Phillips Scholar, May 2021 – Dec 2021
Air Force Research Laboratory, Albuquerque, NM
- Investigated advanced machine learning algorithms for parameter sensitivity analysis.
- Demonstrated active learning surrogate models that reduced computational cost and introduced interactive queries for high power microwave optimization.

RESEARCH INTERESTS:
- Digital reconstruction of the human brain and linking to a virtual environment
- Biologically plausible computational models of neural circuits and behavior
- Investigation of how human brains learn and process sensory information
- Personalized neurophysiological treatments and mimicry of human-level behaviors
- Connections and gaps between the human brain and artificial intelligence
- Advancement of interdisciplinary research involving computer science

PRESENTATIONS:
Modeling Divisive Normalization in the Central Auditory Pathway With Convolutional Neural Networks presented at MIT Summer Research Program Symposium, Cambridge, MA, August 2023 (poster)

Cross-Organizational Continual Learning of Cyber Threat Models presented at Annual Computer Security Applications Conference, Austin, TX, December 2022 (poster)

Cross-Organizational Continual Learning of Cyber Threat Models presented at Cyber Visiting Student Research Program Symposium, Rochester, NY, August 2022 (oral)

ORGANIZATIONS AND MEMBERSHIPS:
RIT Neurotechnology Exploration Team, Aug 2022 - Present
- Designed meta learning neural networks to predict emotional thought across

multiple subjects
- Experimented with Electroencephalogram (EEG) devices used to collect real-time data from subjects

RIT Artificial Intelligence Club, Apr 2022 - Present
- Participated in weekly seminars exploring recent advances in machine learning and neural network applications
- Explored the use of LSTMs to generate music based on music preferences from Spotify
- Collaborated with Women in Computing at RIT to co-organize meetings and promote inclusion of women in artificial intelligence research

Air Force Reserve Officers' Training Corps, Detachment 538, Aug 2019 - Apr 2022
- Engaged in leadership activities and training alongside fellow cadets in group leadership projects, field training exercises, and drill practice.
- Created weekly outdoor fitness sessions to complement program mandatory training.

Arnold Air Society, Colonel Andrew J. Dougherty Squadron, Sep 2019 - Apr 2022
- Coordinated initiatives to foster partnerships with local businesses and enhance community education about the Air Force within the Rochester area.
- Served on the service committee and organized 9/11 Vigil at Rochester Institute of Technology.

TECHNICAL SKILLS:
- ***Computational***: Python, C++, C, MATLAB, Java, SciPy, Sklearn, PyTorch, Tensorflow, Brian/Brian2, SQL
- ***Hardware:*** Arduino, Raspberry Pi, OpenBCI EEG, BioRadio EMG/EOG/ECG
- ***Software***: Git, Vim, VS Code, Jupyter Notebook, IntelliJ, PyCharm, LaTeX, Microsoft Office, Google Drive Suite