JACOPO TENEGGI

(646) 575-9400   ·   jtenegg1@jhu.edu   ·   jacopoteneggi.github.io

EDUCATION

JOHNS HOPKINS UNIVERSITY, **PhD in Computer Science**
Starting Fall 2022, Advisor: Prof. Jeremias Sulam. Relevant coursework: (EN.553.730) Statistical Theory, (EN.553.740) Machine Learning I, (EN.601.682) ML: Deep Learning, (EN.580.709) Sparse Representations in CV and ML, (EN.601.674) ML: Learning Theory, (EN.553.739) High-Dimensional Probability.

JOHNS HOPKINS UNIVERSITY, **MSE in Biomedical Engineering – Biomedical Data Science**
Graduated May 2022, GPA: **3.93/4.00**. Thesis: *"Multiple Instance Learning as a Framework to Explain with Shapley Coefficients"*. Thesis Committee: Prof. Jeremias Sulam (Advisor), Prof. Soledad Villar, Prof. Adam Charles.

POLITECNICO DI TORINO, **BS in Biomedical Engineering**
Graduated July 2020, GPA: **3.93/4.00**, Honors: **IEEE HKN Honor Society - Mu Nu Chapter.**

SKILLS

Python, PyTorch, HuggingFace, DeepSpeed, Docker, AWS EC2, GCP Compute, Azure ML, MATLAB, SQL, MongoDB.

RESEARCH PROJECTS

Distributed Pretraining of LLMs on Biomedical Corpora   nference, Inc.

(Data Scientist Intern, Summer 2021) Built an efficient pipeline for distributed pretraining and finetuning of Large Language Models (LLMs) on biomedical corpora and unstructured clinical notes. Outperformed production-level models on downstream tasks. Worked under the supervision of Dr. Colin Pawlowski.

Conditional Independence Testing via the Shapley Value   Johns Hopkins University

(Under review) Proved that the Shapley value carries a specific statistical meaning in binary classification problems. Devised a valid testing procedure and showed with experiments on synthetic and real data how to use this procedure in practice to explain model predictions. Joint work with Prof. Yaniv Romano.

Fast Hierarchical Games for Image Explanations   Johns Hopkins University

(Published in IEEE TPAMI) Developed *h-Shap*: a fast, novel, hierarchical explanation method for computer vision models based on the Shapley value. Demonstrated that h-Shap beats the current state of the art (GradCAM, LIME, and SHAP) on both runtime and accuracy by orders of magnitude in certain problems relevant to medical imaging.

Entropy Estimation within *in-vitro* neural-astrocyte networks   Georgetown University

(Published in Physical Review E) Devised analysis tools to evaluate information transmission in embryonic *in-vitro* neuronal-astrocyte networks. Showed that mice with a genetic mutation connected with Alzheimer dissipate exponentially more information that healthy mice over development. Joint work with Prof. Rhonda Dzakpasu and Prof. Umberto Lucia.

POSTER AND ORAL PRESENTATIONS

(Upcoming, November 2022) RSNA Annual Meeting—Scientific Presentation   [oral] [poster]

Princeton Machine Learning Theory Summer School 2022   [poster]

Workshop in Interpretable Machine Learning in Healthcare, ICML 2021   [oral] [poster]

PUBLICATIONS

Teneggi, J.*, Bharti, B.*, Romano, Y. and Sulam, J., 2022. From Shapley back to Pearson: Hypothesis Testing via the Shapley Value. arXiv preprint arXiv:2207.07038.

Teneggi, J., Luster, A., and Sulam, J., 2022. Fast Hierarchical Games for Image Explanations. IEEE Transactions on Pattern Analysis and Machine Intelligence. **Best Paper Award at IMLH, ICML 2021.**

Athey, T.L., Teneggi, J., Vogelstein, J.T., Tward, D.J., Mueller, U. and Miller, M.I., 2021. Fitting splines to axonal arbors quantifies relationship between branch order and geometry. Frontiers in Neuroinformatics, p.38.

Teneggi, J., Chen, X., Balu, A., Barrett, C., Grisolia, G., Lucia, U. and Dzakpasu, R., 2021. Entropy estimation within in vitro neural-astrocyte networks as a measure of development instability. Physical Review E, 103(4), p.042412.