Jackson Petty

206 Elm Street Box #205585, New Haven, CT 06520

research@jacksonpetty.org • jacksonpetty.org

EDUCATION

Yale College, New Haven, CT   2017 – Present

– Pursuing Bachelors of Art in Mathematics and Linguistics;
– Board member, Yale Undergraduate Mathematics Society. Founding member, Student Advisory Committee to Mathematics Department.

Le Centre de Langue et de Culture, Marrakech, Morocco   Summer 2016

– Received National Strategic Language Initiative for Youth (NSLI-Y) scholarship from the U.S. Department of State to study Modern Standard Arabic.

PEER-REVIEWED PUBLICATIONS

[1] Hirsch, J., Li, K., **Petty, J.**, and Xue, C. Jan. 2021. "Certain Hyperbolic Regular Polygonal Tiles are Isoperimetric". In: *Geom. Dedicata* 211 (1). arXiv: `1910.12966`.

[2] Hirsch, J., Li, K., **Petty, J.**, and Xue, C. Jan. 2021. "The Optimal Double Bubble for Density r^p". In: *Rose-Hulman Und. Res. J.* 21 (2). arXiv: `1908.10766`.

[3] Frank, R. and **Petty, J.** Dec. 2020. "Sequence-to-Sequence Networks Learn the Meaning of Reflexive Anaphora". In: *Proceedings of the Third Workshop on Computational Models of Reference*, *Anaphora and Coreference*. Ed. by M. Ogrodniczuk, V. Ng, Y. Grishina, and S. Pradhan. Barcelona, Spain (online): Association for Computational Linguistics, pp. 154–164. arXiv: `2011.00682`. URL: `https://www.aclweb.org/anthology/2020.crac-1.16`.

[4] Di Giosia, L., Habib, J., Hirsch, J., Kenigsberg, L., Li, K., Pittman, D., **Petty, J.**, Xue, C., and Zhu, W. Aug. 2019. *Optimal Monohedral Tilings of Hyperbolic Surfaces*. arXiv: `1911.04476`.

RESEARCH EXPERIENCE

Undergraduate Research Fellow, CLAY Lab   Summer 2020

– Designed and conducted experiments exploring the ability of recurrent networks to acquire algebraic generalization necessary to parse reflexive anaphors in model language;
– Designed and built custom training and evaluation platform for neural networks;
– Presented novel results at 2020 *Conference on Reference*, *Anaphora*, *and Coreference*;
– Built models in PyTorch, statistical analysis in Python and R.

Undergraduate Research Fellow, SUMRY REU   Summer 2019

– Identified isoperimetric tilings of compact hyperbolic manifolds and 2-dimensional bubble candidates in weighted Euclidean space;
– Discovered counterexamples to previous assumptions of monotonicity in tiling area;
– Extended Hales' theorem to regular polygonal tiles of certain area of closed hyperbolic manifolds.

PROJECTS & MANUSCRIPTS

[5] **Petty, J.** and McCowin, D. May 2020. *BERT Goes to Wall Street: Predicting adjusted, short-term stock movement through sentiment analysis of earnings calls.*

[6] **Petty, J.** Dec. 2018. *Language Revitalization in Montana Salish & Hawaiʻian.*

[7] **Petty, J.**, Zhang, Y., and Kuldinow, D. May 2018. *Infant Mortality and Life Expectancy among World Bank Member States*. GitHub: `jopetty/S-DS-230`.

[8] **Petty, J.** May 2018. *SDSS Quasar Analysis*. GitHub: `jopetty/ASTR-356`.

[9] **Petty, J.** Dec. 2017. "Across the Islands: Lexical and Phonetic Variation in Hawaiʻian Dialects." In: *Model Papers from the Disciplines*. Yale University. URL: `https://orgsync.com/173289/files/1481868/show`.

TEACHING EXPERIENCE

Writing Partner   August 2018 – Present

Yale College Writing Center

– Teach Yale college students techniques for writing, editing, and revising a wide variety of writing styles, including essays, creative writing, technical writing, and applications;
– Meet weekly with international students to conduct English as a Second Language tutoring session;
– Selected for exceptional writing and teaching ability;
– Teaching Fellow for ENGL 114, LING 284, HIST 174j.

Writing Tutor   May 2020

Warrior-Scholar Project

– Worked with pre-college students attending university on the GI bill to develop the writing skills and confidence needed to succeed in the academic environment of college;
– Led 1-on-1 and pair teaching sessions as students developed an original, analytical essay on the central questions of American democracy.

INDUSTRY EXPERIENCE

Spatial Deep Learning Intern, HELIX RE   Autumn 2020

– Built and trained custom PyTorch implementations of the Minkowski Engine and RandLA-Net to improve semantic segmentation *mIOU* and *mAcc* performance on proprietary dataset;
– Doubled experimental model performance using entropy-based data segmentation, intelligent class re-grouping, and improvements to model architecture;
– Developed production pipeline for trained segmentation models, leveraging Docker and Google Cloud Storage to automate model inference in production setting;
– Integrated Google Cloud into model training pathway, greatly reducing training time and increasing parallelizability of training routine.