Julian Gold

email julian.thomas.gold@gmail.com
github https://the-ninth-wave.github.io/

Academic researcher transitioning into machine learning. My academic training is in probability theory – I studied random geometries with physical relevance. To develop my computer vision skillset, I trained the Faster R-CNN architecture on a custom dataset built from pdf documents. I'm excited to deliver solutions to difficult machine learning problems.

Programming skills

languages Python

libraries machine learning: TensorFlow, PyTorch image processing: OpenCV, PIL

cloud Colab

database MySQL

Education

Ph.D. in Mathematics, *University of California, Los Angeles* 2012 – 2017
specialization: random networks, statistical mechanics

B.S. (highest honors) **in Mathematics**, *University of California, Davis* 2007 – 2012

Work experience

RTG Postdoctoral Fellow → NSF Postdoctoral Fellow, 2017 – 2021
Northwestern University, Dept. of Mathematics

RTG (Research Training Grant) postdoctoral fellow from September 2017 – August 2018 working under Antonio Auffinger, my sponsoring scientist for the NSF postdoc started in September 2018. Across both roles, responsibilities fell into three categories:

research Leveraged analytic skills towards solving open math problems, studying models with applications ranging in biology, physics, and computer science. Traveled frequently to give talks on work or to attend conferences.

organization Co-organizer of the Northwestern Probability Seminar, responsible for inviting, coordinating with, and hosting visiting speakers.

teaching Taught mathematics classes at Northwestern, including one at the graduate level, and an introductory math course at Stateville Correctional Center through the Northwestern Prison Education Program (NPEP).

Graduate Student Researcher and Teaching Assistant, 2013 – 2017
UCLA, Dept. of Mathematics

research Advised by Marek Biskup, whom I met with regularly for guidance, and to report thesis progress. To develop analytic skills further, attended a quarter-long research program at the Institut Henri Poincaré in Winter 2015. Collaborated with Oren Louidor and Aser Cortines.

teaching Held weekly discussion sections and office hours as a teaching assistant for several UCLA math courses. These courses included calculus, linear algebra, and probability.

Projects

***Faster R-CNN* on a dataset of academic papers**

Starting with a collection of pdfs, hand-labeled in LabelImg, I developed a training pipeline using the Faster R-CNN architecture. The resulting trained network can draw bounding boxes around formulas with labels, i.e. those formulas which are referenced throughout the paper. The details of this project can be found at this webpage.

Selected publications and preprints

The number of saddles of the spherical p-spin model (preprint)

with A. Auffinger.

Dynamical freezing in a spin glass system with logarithmic correlations

with A. Cortines and O. Louidor.

Electron. J. Probab. Volume 23 (2018), paper no. 59, 31 pp.

Isoperimetry in supercritical bond percolation in dimensions three and higher.

Ann. Inst. H. Poincaré Probab. Statist. Volume 54, Number 4 (2018), 2092 – 2158.