Matthew Cadier Kim

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About Me

I am a researcher in combinatorial optimization and machine learning. On the application side, I work on image processing methods and neural network architectures for medical data. As a mathematician, I am interested in a class of polytopes related to classical root systems and submodular set functions. More broadly I am interested in combinatorics and discrete geometry. With experience in both professional software development and pure math research, I have an adaptive skill set combining scientific rigour and application-minded heuristics.

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Education

SFSU: M.A. in Mathematics, 2015 (in progress)
Advisor: Dr. Federico Ardila.
Thesis: *The Geometry of Generalized W Permutohedra*
SFSU: B.A. Mathematics, Philosophy, Computer Science, May 2012

Awards

Maxwell Scholarship, College of Science and Engineering, SFSU, $4,000, 2013-14.
$(CM)^2$ grant, Department of Mathematics, SFSU, $5,000, 2012-2013.

Papers

A Neural Network Architecture for Detecting Trachoma Infection on Everted Eyelids
with Dr. Travis Porco (UCSF) and Dr. Kazunori Okada.
A Characterization of Generalized Permutohedra of the Classical Reflection Groups
with David Arcila and Julián Romero, 2015

Work History

Visiting Researcher — UCSF: UCSF The Francis I. Proctor Foundation
San Francisco, CA — May, 2015 - December 2015
Research and develop a novel artificial vision algorithm to detect the presence of follicles on images of everted eyelids using a convolutional neural networks. Additionally I work on an image processing pipeline to label, segment and preprocess the images coming from the field.

Data Science Associate — Argyle Data
San Mateo, CA — June, 2014 - February, 2015
I worked alongside the senior software engineer to research, prototype, and develop machine learning and statistical algorithms for fraud detection.

Graduate Teaching Assistant — SFSU
San Francisco, CA — September 2012 - December 2014
Taught undergraduate algebra, precalculus and calculus courses.

Selected Projects

- Researching, implementing, and testing hidden Markov models for fraud detection in a telecommunications network. This involved extensive exploration, querying, and munging of network packet data.
- Adapted and implemented a counting Bloom filter design from an AT&T research paper for Spam detection in SMS traffic.

- Investigating the applicability of a recurrent neural network classifier for use on a set of medical images gathered by researchers at the Francis I Proctor Foundation at UCSF. (in progress)

Programming Languages	Java, Python, Matlab, Julia, C/C++, Ruby, Latex
Languages	English (Native), French (Fluent written and oral)
References	**Arshak Navruzyan**, VP of Product Management, Argyle Data, `arshak.navruzyan@argyledata.com` **Dejan Miljkovic** Senior Software Engineer, Argyle Data, `dejan.miljkovic@argyledata.com`