

# PAUL P. PARK

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## EDUCATION

**Northwestern University, Evanston, IL**

Anticipated 2016

Ph.D. Candidate in Engineering Sciences & Applied Mathematics

**Northwestern University, Evanston, IL**

2010

B.S. with Honors in Engineering Sciences & Applied Mathematics, *Summa Cum Laude*

Double major in Mathematical Methods in the Social Sciences, Jeanette M. Dacey Award

## RELEVANT EXPERIENCE

**Graduate Research Assistant**

2011 - Present

*The Laboratory for Complex Systems and Nonlinear Dynamics in Fluids and Granular Materials*

Goal: Develop analytical and numerical methods for better understanding mixing by cutting and shuffling

- Detected the existence of non-mixing regions by comparing visual proxies of the exceptional set ( $E$ ) for piecewise isometries (PWI) with mixing patterns from simulations
- Obtained characteristic data on  $E$  by quantifying simulated  $E$  for 4000 different parameters applying numerical methods in C++, fitting data to an exponential function in MATLAB based on prior understanding of fractals, and filtering data based on goodness-of-fit
- Compared data of  $E$  for over 2000 parameters with existing mixing metrics and observed a linear correlation, suggesting that the measure of  $E$  is a useful predictor for degree of mixing
- Created custom MATLAB scripts to generate videos that facilitate understanding of PWI, as well as the existence of an exceptional set

**Data Science Project:** Visualizing Medicare Data and Identifying Underserved Regions

- Worked with Medicare prescription data made public by the government, a 2.9 GB text file with 24M entries amounting to total drug costs of \$76B
- Implemented data streaming and data joining methods to avoid memory issues with large data sets and to gather drug costs by US counties in pandas, a Python data analysis package
- Employed additional data on diabetes prevalence from the Centers for Disease Control and Prevention (CDC) to do exploratory analysis on the possibility of underserved counties
- Used the CartoDB API to visualize various geocoded data on a map of the US, add custom features, and host on personal website

## LEADERSHIP & TEAM WORK EXPERIENCE

**President**, Society for Industrial & Applied Mathematics (SIAM) Student Chapter

2014 - 2015

- Launched a mini-poster session, SIAM Unposter Party (SIAM UP), promoting student presentation and interdisciplinary interaction at Northwestern (31 students from 8 departments attended)
- Streamlined submission process using Google forms and drop box created through Google scripts app

**Conference Chair**, 2014 Chicago Area SIAM Student Conference (CASSC)

2014

- Coordinated with SIAM student chapters from 2 other universities to host 2014 CASSC
- Built and maintained conference website by learning how to write HTML script
- 51 students attended from Wisconsin, Michigan, Notre Dame, Loyola, UIC, IIT, and Northwestern compared to  $\sim 20$  from previous year

## SKILLS

- *Communication*: Technical presentation and public speaking
- *Programming*: MATLAB (proficient), Python (intermediate), C++ (intermediate), MySQL (beginner), Linux shell scripting (beginner), HTML (beginner)
- *Language*: Fluent in Korean