

# MOHAMMED MODAN

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## EDUCATION

Macalester College

2014 – May 2018

3.85/4.0 GPA

St. Paul, MN

**Majors:** Applied Math, Chemistry

**Notable Courses:** Projects in Data Science,  
Computational Linear, Machine Learning

**Publications:** Pyridinium-functionalized Pyromellitic Diimides with  
Stabilized Radical Anion States (*ACS Omega* 3, 1, 240-245)

**Poster Sessions:** ACTC Symposium (x2), Macalester (x2)

**Awards:** John Howe Scott Sophomore Chemistry Prize, Violet Olson Beltmann Endowed Prize (Junior Chem prize)

## PROJECTS

*Machine Learning R Package in Java*

Fall 2017 - Present

Macalester College, St. Paul

- R package implementing a weighted reduced convex hull-based Support Vector Machine algorithm from literature
- Implemented kernels by rebuilding the algorithm/equations from scratch, used RBF to recognize handwritten digits
- Written from scratch in Java with caching, multithreading, and multiclass support. Using R with rJava as a frontend

*MinneMUDAC Advanced Finalist (Solo)*

October 2017

MinneAnalytics, Macalester

- Data competition analyzing 13 million claims of 40,000 patients, predict high cost patients in the future
- Competed solo against mostly teams of 4+, ~450 students. Finalist in the undergraduate-advanced division
- Present findings in 4 rounds of 4 judges. Present to 350+ students/judges in finals

*Qik-n-Ez Gas Data Analysis*

Fall 2017

Macalester College, St. Paul

- Data science capstone project analyzing a gas station company's loyalty/in store program, cluster customers
- Wrangle large datasets with R in a 4-person team; create visualizations, models, and present findings

*Graphing Characters in Books (R Package in Java)*

March 2018

Macalester College, St. Paul

- Multithreaded program that finds character relationships in text files and outputs an adjacency matrix/graph

*Animated Image Morphing*

Spring 2016

Macalester College, St. Paul

- Implement the Beier-Neely image morphing in Mathematica, animate in parallel by vector parameterization
- Design an easy point and click interface to load images, assign morphing vectors, loading bar

**Other Projects:** JACS Analysis (heavy data scraping, Naïve Bayes), mhmdmodan.com (scratch, WIP), TimeClock Chrome Plugin

## WORK EXPERIENCE

*Supplementary Instruction Leader*

Fall 2016, 2017

Macalester College, St. Paul

- Lead 60 hours of weekly instruction/pre-test sessions for Accelerated General Chemistry, + office hours
- Create 10-15 challenging problems/week which encourage students to cooperate for a solution

*Organic Chemistry Research*

Spring 2015 – Summer 2017

Macalester College, St. Paul

- Analyze data and build a story from concepts/chemical properties that may lead to such results or anomalies
- Train and lead new chemists in laboratory/research practice, direct to assist with my own research
- Present research/data and communicate results at poster sessions and regular literature discussions

**Other Experience/Projects:** Accelerated Gen. Chem. Lab TA (Fall 2015), Help Desk Consultant (2014-2016)

## SKILLS/INTERESTS

**Proficient:** Analysis in R/RStudio, software in Java, Wolfram Mathematica, Adobe Photoshop

**Sufficient:** SQL, Python, HTML/CSS/JavaScript/JQuery/AJAX