

# MICHAEL CULLAN

## SKILLS

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<b>Python</b>	pandas, Web Scraping Dynamic Content, Bokeh, Flask, REST API, NLP
<b>R</b>	Package Development, Cluster Computing, Web Scraping, Parallelization, ggplot2
<b>Statistics</b>	Linear Models, Model Selection, Nonparametric Statistics, Experimental Design
<b>Machine Learning</b>	scikit-learn, Regression, Feature Engineering, Transfer Learning, TensorFlow
<b>Other</b>	SQL, AWS, Google Cloud Platform, Spark, MapReduce

## EXPERIENCE

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**Graduate Research Assistant** Jan 2017 - Dec 2018  
Arizona State University Tempe, AZ

- Developed statistical theory for a novel error-controlled model selection procedure for selecting among non-nested statistical models with a specified degree of confidence
- Authored an R package for performing the procedure with user-specified models and visualizing results
- Utilized S3 classes and closed-form, vectorized fitting functions to improve computational speed for bootstrapping linear regression models by up to 10 times compared to running separate `lm()` calls
- Identified and algorithmically corrected unique sources of bias in parameter estimates to improve model accuracy
- Performed R simulations on HTCCondor cluster to obtain output data 40 faster compared to using a single machine
- Co-authored a research grant proposal for additional project funding

**Summer Research Program Scholar** July 2017  
University of Washington Seattle, WA

- Implemented bootstrap tests of phylogenetic trees in Python to test among regional variants of infectious diseases
- Performed Python simulations epidemic contact network dynamics to test population-level effects of vaccination

**Undergraduate Teaching Assistant** Jan 2015 - Dec 2016  
University of Arizona Tucson, AZ

- Delivered lectures in Vector Calculus and Discrete Mathematics and organized exam review sessions

**Undergraduate Research Assistant** Aug 2015 - May 2016  
University of Arizona Tucson, AZ

- Identified text-based music notation softwares to represent music notation in Python-compatible structures for building artificial intelligence software for collaborative jazz improvisation
- Located and classified discrepancies between human and automatic MIDI transcriptions of recorded jazz solos to justify additional funding for human transcription

## EDUCATION

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**Master of Science in Statistics** December 2018  
Arizona State University Tempe, AZ

**Bachelor of Science in Mathematics** May 2016  
University of Arizona Tucson, AZ

## PUBLICATIONS

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**Journal of Applied Statistics** Submitted Dec 2018

## PERSONAL INTERESTS

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**Founder / Creative Director** April 2017 - Present  
Grid Search Club Logistics Phoenix, AZ

- Organized and designed visual content for 31 events in Phoenix, Los Angeles, and Detroit to promote forward-thinking digital art and music
- Developed Python-based facial-detection installation shown in Phoenix and Detroit and built a sound-responsive Arduino-based lighting system for Tucson's Hotel Congress Festival 2018