

# Garrett Bingham

YALE UNIVERSITY '19  
B.S. COMPUTER SCIENCE & MATHEMATICS

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## TensorFlow Graph Optimization

### Reservoir Labs

New York, NY · Summer 2018

- Extended capabilities of R-Stream-TF, a tool which parallelizes and optimizes TensorFlow (TF) graphs, to:
  - Support equivalent C code generation for additional TF operations. Supporting more TF operations allows for greater flexibility in choosing subgraphs to optimize.
  - Generate CUDA C kernel representations of optimized subgraphs, along with C++ custom op registration for TF. These run on the GPU, offering potentially dramatic speedups for highly parallelizable TF computations.
  - Intelligently select TF subgraphs to optimize, based on the size and structure of the TF graph, the types of TF operations present, and the target architecture.

## Face Recognition

### University of North Carolina Wilmington

Wilmington, NC · Summer 2017

- Developed RS-2DLDA, a novel face recognition algorithm that outperformed similar 2D machine learning algorithms on the MORPH-II and ORL datasets.
- Corrected 1,800 errors in the 55,000 entry MORPH-II dataset that previously published research had missed.
- Gave weekly presentations, in addition to tutorials on RMarkdown,  $\LaTeX$ , and Two-dimensional PCA in Python to program students and faculty.
- 8 of 100+ chosen for research program. 1 of 8 chosen to present poster at CUR REU Symposium.

### PUBLICATIONS

Bingham, Garrett. "Random Subspace Two-Dimensional LDA for Face Recognition." ArXiv.org e-Print Archive, 2017, arxiv.org/abs/1711.00575. (Submitted to Pattern Analysis and Applications.)

Bingham, Garrett, et al. "MORPH-II : Inconsistencies and Cleaning Whitepaper." North Carolina Digital Online Collection of Knowledge and Scholarship, 2017, libres.uncg.edu/ir/uncw/listing.aspx?id=22243.

### PRESENTATIONS

NES Mathematical Association of America Meeting	Sacred Heart University	Nov. 17-18, 2017	Oral
Council on Undergraduate Research REU Symposium	The Westin Alexandria	Oct. 22-23, 2017	Poster
REU Research Showcase	UNC Wilmington	Jul. 24, 2017	Poster

## Additional Projects

### WEB AUTOMATION

Created a Python script which utilizes SeleniumWebDriver and other libraries to automate student registration for My Tech High, an online learning provider.

### SNAP

Wrote Autolt3 script which makes the current window take up half of the screen to allow for easy left/right or top/bottom viewing. To date, Snap has 2,300+ downloads: [goo.gl/oC37fM](http://goo.gl/oC37fM)

## Extracurriculars / Service

### Calculus Tutor

Yale University · Oct '16 - May '17

Held weekly one-on-one tutoring sessions to assist students in their calculus classes.

### Bridges ESL

New Haven, CT · Jan - May '17

Gave weekly English lessons to New Haven immigrants and international citizens.

### Demos

New Haven, CT · Aug '16 - May '17

Conducted weekly science experiments with a local class of 4th graders.

### Daycare Assistant

Calvin Hill Daycare · Aug - Dec '16

Read books, built towers, and learned how to take turns with a class of 3-year-olds.

### Yale Hunger and Homelessness Action Project

New Haven, CT · Jan - May '16

Served on YHHAP fundraising board and raised awareness for YHHAP projects.

### Glasses for Vanuatu

Harrisville, UT · Mar - May '14

Organized a service project that raised \$900 and collected 300 pairs of reading glasses which were sent to Vanuatu.

## Coursework

GPA: 3.86

### COMPUTER SCIENCE

- Systems Programming & Computer Organization
- Computational Vision & Biological Perception
- Theory of Computing\*
- Algorithms\*
- Data Structures & Programming Techniques

### MATHEMATICS

- Abstract Algebra
- Quantum Probability & Quantum Logic\*
- Topics in Analysis
- Discrete Mathematics
- Probability Theory
- Linear Algebra & Matrix Theory
- Multivariable Calculus

\* Course from AIT-Budapest

## Skills

### PROGRAMMING

#### Experienced:

C · Python · R ·  $\LaTeX$

#### Familiar:

MATLAB · HTML/CSS · CUDA

### LANGUAGES

English Native ●●●●●  
Spanish ILR 3 ●●●○○  
Hungarian ILR 1 ●○○○○

## Other

Studied Computer Science at Aquincum Institute of Technology in Budapest, Hungary during Spring 2018.

Spent Summer 2016 in Bilbao, Spain, studying Spanish language and culture.

Received Boy Scouts of America's Eagle Scout Award.