

# JACOB VAN GEFFEN

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## EDUCATION

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### University of Texas at Austin

Bachelor of Science – Computer Science (Honors, Turing Scholar)  
Bachelor of Science – Mathematics  
Graduating May 2018  
Cumulative GPA: 3.97

## RESEARCH EXPERIENCE

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### Symbolic Reasoning for Automatic Signal Placement – *University of Texas at Austin* Summer 2017

- Designed tool to generate `signal()` calls for OS-level monitor code
- Created the concept of a monitor invariant to aid in static analysis of user code
- Developed and implemented new algorithm for finding strong monitor invariants
- Paper submitted to PLDI 2018

### Cache-Replacement with Machine Learning – *University of Texas at Austin* Fall 2016

- Augmented state-of-the-art policy (Hawkeye) by improving classification of `load` commands
  - Implemented perceptrons to replace simple saturating-counter classifiers
- Evaluated replacement policy over SPEC CPU 2006 benchmarks

### Component-based synthesis for R – *University of Texas at Austin* Summer 2016

- Created a synthesis tool to generate code in R given input/output examples
- Developed technique to reason about synthesized programs using first-order logic
- Formalized the notion of a partial program in the context of data-manipulation
- Paper accepted to PLDI 2017

## PUBLICATIONS

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- Yu Feng, Ruben Martins, Jacob Van Geffen, Isil Dillig, and Swarat Chaudhuri. 2017.  
**Component-based synthesis of table consolidation and transformation tasks from examples.** In PLDI. ACM, 422–436.

## WORK EXPERIENCE

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### Airbnb – *Software Engineering Intern* (San Francisco, California) Summer 2018

- Offer accepted; to be completed in Summer 2018

### Head Discrete Mathematics Proctor – *Department of Computer Science* (Austin, Texas) Fall 2017

### Discrete Mathematics Proctor – *Department of Computer Science* (Austin, Texas) Fall 2016

- Taught in twice-weekly discussion sections and weekly office hours
- Covered topics including propositional logic, first-order logic, combinatorics, and graph theory
- Mentored two undergraduate proctors

### Google – *Engineering Practicum, BigQuery Team* (Seattle, Washington) Summer 2015

- Created Google Dataflow pipelines for uploading large public datasets into Google BigQuery
- Implemented end-to-end tests between Dataflow and BigQuery
- Open-sourced code and documentation for public use

### Lockheed Martin – *Internal Tools* (Fort Worth, Texas) Summer 2014

- Designed an automated build procedure, replacing old Perforce system
- Created front-end data entry form

## **LEADERSHIP EXPERIENCE AND ACTIVITIES**

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### **Kids Who Code** – *Director, Excellence Award Winner*

Fall 2015-Present

- Lead program dedicated to teaching underprivileged 8<sup>th</sup>-graders the basics of programming
- Regularly create and deliver engaging lessons with a group of 10 UT students
- Designed 2-semester weekly lesson outline to cover a broad array of CS topics

### **Natural Sciences Council** – *IT Director*

Fall 2014-Spring 2016

- Helped manage college-wide events, such as Natural Sciences Week
- Created and maintained organization website

## **RELEVANT COURSEWORK**

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Artificial Intelligence  
Numerical Analysis  
Quantum Information Science  
Machine Learning and Vision  
Prediction Mechanisms in Computer Architecture  
Automatic Verification of Software  
Principles of Operating Systems  
Topology II – Knot Theory  
Algorithms and Complexity  
Algebraic Structures  
Programming Languages  
Topology  
Real Analysis  
Automated Logical Reasoning (audited)  
Computer Architecture  
Data Structures  
Discrete Mathematics

## **HONORS**

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- Turing Scholars Program – Computer Science Honors
- College of Natural Sciences Scholarship Award Winner 2017
- Unrestricted Endowed Presidential Scholarship Award Winner 2017
- Chevron Scholarship Award Winner 2017
- Computing Research Association Outstanding Undergraduate Research Award Nomination 2017
- College of Natural Sciences Scholarship Award Winner 2016
- Chevron Scholarship Award Winner 2016
- College of Natural Sciences Scholarship Award Winner 2015
- Chevron Scholarship Award Winner 2015
- Houston Dow Institute Scholarship Award Winner 2015
- Houston Dow Institute Scholarship Award Winner 2014
- HackRice First Place Award 2014

## **Programming Experience**

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- Experienced in **Java**, **Android Development**, and **XML**
- Exposure to **Python**, **C**, **C++**, **HTML**, and **JavaScript**