Tobin Yehle

Open Source Contributions

- Two patches to mypy, the Python type checker
- Type annotations for a Python package emulating Rust's `Result<T, E>` structure

Work Experience

2018-Now **U of U Department of Education**
Freelance Software Developer
Web App for online therapy

2017-Now **3M HIS**
Data Science Lab
Software Developer
Built tools for distributed data analysis with Spark in AWS

2015-2016 **University of Utah**
Research Assistant
Senior thesis research under Dr. Vivek Srikumar

2014-2015 **University of Utah**
Teaching Assistant
Machine Learning & Intro to Computer Science.

2014 **Florida Institute of Technology**
Research Assistant
NSF funded Research Experience for Undergrads hosted by FIT resulting in 2 publications.

2012-2014 **Fusion-io**
Software Developer
Build and QA automation. Contributed to a refactor of the test infrastructure.

Education

2018 **Recurse Center**
Self directed programming retreat

2011 – 2016 **University of Utah**
Honors BS Computer Science
Magna cum Laude
Undergrad Research Scholar
Minors in Music & Astronomy

Interests

Topics: Functional Programming, Compilers, Distributed Systems, Machine Learning, Data Analysis

Languages: Scala, Haskell, Python, Racket, C++, Rust, miniKanren, F#, bash, Elm, SQL

Tools: AWS, Spark, git, LLVM, LaTeX

WHOAMI

Trumpet Player, Climber, Potter, Skier, Biker, Hiker

Projects

Parsing with Derivatives

Senior thesis project to extended the derivative parsing algorithm to English.
Goal: Caching parser for increased performance on large datasets.
Method: The derivative parser is left to right, producing a savable state after parsing each token. This state can then be loaded from a cache if a matching sentence prefix is seen in the future.
Results: The parser produced the correct parse trees, but the implementation needed optimization and benchmarking proved difficult.

Python Compiler

Project for a compilers class written in Racket.
Spec: Lex and parse all of Python 3. Implement two desugaring passes, eliminating most syntactic constructs.
Results: Syntax was ready for one more desugaring pass before code generation in assembly language.

LLVM Compiler

Project started at the Recurse Center.
Spec: Compile a non-trivial language to x86 using LLVM
Results: Implements closure conversion without garbage collection and converts all expressions to SSA.

Spatial Structure of Crime

Research Experience for Undergrads project at FIT.
Goal: Use complex networks on police data to uncover structure in the timing and location of crimes.
Method: We built networks with links between spacial or temporally close crimes, and used network clustering algorithms to find interesting regions.
Results: Two publications, [White et al., Social Informatics, 2015] and [Oliveira et al., Complex Networks VI, 2015]. Allowed new types of visualizations.

Clustering of Suicide Cases

Project with the Department of Psychiatry at U of U.
Goal: Find familial groups in suicide cases. Find demographic or diagnostic attributes related to suicide. Possibly find genetic attributes related to suicide.
Method: I used network clustering algorithms to find familial groups of suicide cases.
Results: Some diagnostic abnormalities found. Research group is using the clusters for further analysis.

Other Projects

- Compiler targeting the λ-calculus
- Sherlock, a question answering system
- AIs for dominion, sudoku, wumpus world, etc.
- Sheet-music optical character recognition
- Genetic algorithm convergence project
- Simulations of charged particles and dynamic friction
- More on github and bitbucket

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