Peter Goldsborough

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WORK EXPERIENCE

- **Facebook**, London, United Kingdom   04/2017 — Present
  Intern, Real Time Systems

    ○ Optimizing highly distributed real time infrastructure at the core of Facebook.

- **Bloomberg**, London, United Kingdom   11/2016 — 04/2017
  Intern, Instant Bloomberg

    ○ Added functionality to the Instant Bloomberg (IB) messaging system to trace messages across every hop.
    ○ Wrote a network traffic simulation tool that produces messages to Apache Kafka message queue clusters.
    ○ Included a mathematical expression lexer and parser to model traffic according to functions of time.
    ○ Visualized latency and message type distribution in our systems in Splunk dashboards.
    ○ Gave a training seminar about LLVM and Clang to ~ 30 Bloomberg engineers.

- **Google**, London, United Kingdom   08/2016 — 11/2016
  Intern, gTech

    ○ Built chatbots in Go, using the natural language processing engine inside Google's Allo app.
    ○ Developed a web platform to showcase Google's ad technologies.
    ○ Wrote reference implementations of how to fetch and display ads from Google's ads servers (DFP).
    ○ Open-sourced an integration of Google's GPT ad-serving JavaScript library with AngularJS, under an official Google GitHub organization: github.com/googleads/angular-dfp

- **Technical University Munich**, Germany   04/2016 — 09/2016
  Research Assistant, Chair for Database Systems

    ○ Investigated various interprocess communication techniques for low latency transmission of database queries.
    ○ Implemented a software library that replaces domain sockets by injecting a custom shared memory channel.
    ○ This can speed up a variety of applications by an order of magnitude.
    ○ Wrote more than 10,000 lines of low level C code.

- **Klagenfurt University**, Austria   10/2014 — 07/2016
  Research Intern, Institute of Networked and Embedded Systems

    ○ Ported Non Intrusive Appliance Load Monitoring (NIALM) algorithms from MATLAB to Python and C++.
    ○ Investigated machine learning techniques to make NIALM algorithms unsupervised.
    ○ Invented custom $O(N \log N)$ clustering algorithm to replace existing $O(N^2)$ solution.
    ○ Visualized real-time appliance energy data in a Heroku cloud app.
    ○ Wrote 8363 lines of C++ code (working 5-10 hours/week)

EDUCATION

- **BG | BRG St. Martin High School**, Villach, Austria   09/2011 — 06/2015

    ○ Graduated as valedictorian with straight A's across all subjects and my thesis.
    ○ 120-page diploma thesis on *Developing a Digital Synthesizer in C++*, investigating the mathematics, digital signal processing and software engineering behind digital music synthesizers.
    ○ School president 2013/2014; long-time involvement in student representation.
    ○ 3rd place in state rhetoric competition; 4th place in state philosophy contest.
    ○ Participated in the Atlas Shrugged essay competition organized by the Ayn Rand Institute.

- **Technical University of Munich (TUM)**, Germany   10/2015 — Present
  B.Sc. in Computer Science

  - Highlights:
    - ⋆ Admitted with a score of 100/100.
    - ⋆ Top 5% in every course.
    - ⋆ Awarded German National Scholarship (Deutschlandstipendium).
  - First Semester:
    - ⋆ Discrete Mathematics; 95th percentile.
    - ⋆ Introduction to Database Systems; 99th percentile.
    - ⋆ Introduction to Computer Architecture; 97th percentile.
    - ⋆ Introduction to Computer Science; 98th percentile.
    - ⋆ Fundamentals of Programming: 99th percentile (291.5/292 points).
  - Second Semester:
    - ⋆ Linear Algebra; 99th percentile.
    - ⋆ Introduction to Computer Networks and Distributed Systems: 99th percentile.
    - ⋆ Introduction to Algorithms and Data Structures; 90th percentile, 96% on assignments.
    - ⋆ Machine Learning Seminar; Topic: "Deep Learning with TensorFlow"; Grade: A.
    - ⋆ Computer Architecture Practicum (Top 20 of "Intro. to Computer Architecture" are selected).

- **Online Education**   07/2013 — Present

  - Coursera:
    - ⋆ Algorithms I (Princeton University)
    - ⋆ Algorithms II (Princeton University)
    - ⋆ Machine Learning (Stanford University)
    - ⋆ Learning How To Learn (University of California, San Diego)
    - ⋆ Calculus I (Ohio State University)
  - Udacity:
    - ⋆ Machine Learning nano-degree (organized by Google)
    - ⋆ Deep Learning (organized by Google)
  - MIT OpenCourseWare:
    - ⋆ Various lectures on efficient algorithms and data structures on undergraduate and graduate level.

PROJECTS

- I lead a team to develop an architecture-independent assembly simulator in C++14 and Qt5 for educational and scientific purposes. We primarily focused on RISC-V as an open-source Instruction Set Architecture (ISA), while keeping all technical doors open to support other architectures such as x86 or ARMv7. Next to development, I was responsible for coordination and management of the team.

- clang-expand is a clang and LLVM based tool to inline function calls and expand macros in C, C++ and Objective-C for visual benefit and easier refactoring. Featured in LLVM weekly: http://llvmweekly.org/issue/169

- Mavrchester is a C library implementing the Manchester Encoding protocol for embedded AVR microcontrollers. Manchester Encoding is a physical-layer communication protocol used for Ethernet and wireless radio frequency transmission. I used this library to build a small wireless weather station on an Atmel microcontroller.

- latexpp is a first-of-its kind C++ library for generating LaTeX equations via C++. It supports conversion of LaTeX equations like \frac{1}{2} to HTML as well as JPG, PNG and SVG images. I made it using Google's V8 JavaScript engine to write JavaScript from C++.

- dispy is a tiny Python bytecode disassembler that can take any piece of Python code (function, method, class etc.) and prints out the underlying cPython bytecode instructions and arguments making up each line of code.

- lru-cache is a feature-complete least-recently-used (LRU) cache implementation in modern C++ that allows for efficient function memoization while avoiding a memory blowup. I additionally implemented a timed LRU cache with a *time to live* for elements, ideal for server-side resource caching

- All my projects can be found at github.com/goldsborough.

ORGANIZATIONS

- European Youth Parliament   07/2013 — Present

  - The European Youth Parliament (EYP), is politically-motivated, non-governmental organization attempting to spread political awareness among youths.
  - There are regular meetings all over Europe concerning current EU-related political topics, such as environmental sustainability, regional development or fiscal policy.
  - I have participated in more than ten such sessions as delegate, chairperson and head organizer.
  - For two years I held the position of Regional Coordinator for the Austrian state of Carinthia.

- Model United Nations   07/2013 — Present

  - Model United Nations is an international association dedicated to simulating the United Nations and allowing youths to directly participate in topics of diplomacy and international relations.
  - In May of 2016, I represented Spain as part of the NATO committee in Maastricht, The Netherlands, discussing subjects such as cyber-warfare and the militarization of the Arctic.

- TU Investment Club   10/2015 — Present

  - The TU Investment Club is a non-profit student organization at Technical University of Munich dedicated to the education of students with a distinct interest in financial markets.
  - I am part of the algorithmic trading team, bringing together computer science and financial knowledge to explore what impact we can have on the financial market.
  - I have been a member of the interviewing committee for applicants with a technical background.

- ACM Student Chapter   07/2016 — Present

  - The Association for Computing Machinery (ACM) Student Chapter at TUM is a group of bachelor's and master's students passionate about computer science, scientific computing and machine learning.
  - We organize regular events with more than 200 attendees with rockstar speakers from the field of artificial intelligence and general computer science.
  - I have managed the invitation and organization of our speakers twice, once Prof. Dr. Sepp Hochreiter and once an engineer from Google DeepMind.

SPEAKING

- Introduction to Machine Learning with TensorFlow @ Python Meetup Munich.   07/2016
- Deep Learning with TensorFlow @ PyCon UK.   09/2016
- Deep Learning with TensorFlow @ PyData London.   12/2016
- The Clang and LLVM Tooling Infrastructure @ C++Now.   05/2017

PUBLICATIONS

- Non Intrusive Load Monitoring: A Review and Outlook, Christoph Klemenjak, Peter Goldsborough, Sep. 2016 — arXiv:1610.01191

- *A Tour of TensorFlow*, Peter Goldsborough, Aug. 2016 — arxiv:1610.01178

LANGUAGES

- German: Native
- English: Native
- French: Limited working proficiency
- Nerd: Native