NATHAN W BREI

PERSONAL INFORMATION

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Address	Beetzstr 5 bei Fockner, 81679 München DE
Date of birth	10.06.1989
Location of birth	Wiesbaden, DE
Citizenship	USA

ACADEMICS

Sept 2015 – Present

Technical University of Munich · *Munich, DE*

M.Sc. (Hons) Computational Science and Engineering
Main courses: *Numerical Programming, Scientific Computing, Fundamental Algorithms, Advanced Programming, Parallel Programming, Parallel Numerics, Scientific Visualization, Patterns in Software Engineering*
Elective courses: *Computational Fluid Dynamics Lab, Multidisciplinary Design Optimization, Multiple View Geometry in Computer Vision*
Honors Project: *Data-Intensive Distributed Computing Workflows in Light Microscopy*

Feb 2013 – Aug 2013

Hacker School · *New York, NY, USA*

A writer's workshop for programmers. Intensive study of functional and logic programming paradigms. Worked on self-guided projects, including DSLs for generating CAD assemblies and simulations of transit networks. Introduced to the programming languages Julia, Clojure core.logic, and OCaml.

Sept 2007 – June 2011

Massachusetts Institute of Technology · *Cambridge, MA, USA*

S.B. Aerospace Engineering · GPA: 3.6/5
Additional coursework: *Applied math, Architecture, Archaeology, Ancient history*
Awards: 3rd Place Lufthansa Prize for Excellence in German Studies

Aug 2003 – June 2007

International School of Düsseldorf · *Düsseldorf, DE*

International Baccalaureate · GPA: 3.65/4
Awards: National Merit Finalist

WORK EXPERIENCE

Sept 2013 – Sept 2015

Software engineer, Droit Financial Technologies · *New York, NY, USA*

Droit provides a system for determining regulatory compliance obligations for over-the-counter derivatives trades. This system is running in production at multiple major financial institutions. The stack was Java, Groovy, Spring, Hibernate, Drools, JBoss, MySql, AngularJS. My work involved core knowledge representation and management, rules engines, introspection, and visualization.

June 2011 – June 2012

Software engineer, Daedalus Innovation · *Williamsburg, VA, USA*

Daedalus provides software engineering contracting for rapid development of startup minimum-viable products. My particular project was BookAndTalk, a site for arranging video chats between authors and book groups. Our stack was Python, Django, PostgreSQL, OpenTok, Heroku. My work involved coding core site functionality, integrating with external libraries such as OpenTok, and managing the deployment.

RESEARCH AND INTERNSHIPS

May 2016 – Feb 2017

Honors Project, TUM Chair of Scientific Computing with Carl Zeiss Microscopy · *Munich, DE*

Led a team of 7 people to design and implement a distributed system for image processing. The system allows an end-user to construct computation graphs using Zeiss existing image processing libraries and deploy them to an Apache Storm cluster. Images acquired from an attached microscope are sent to the cluster and processed in soft real time. The resulting throughput scales with the size of the cluster while the latency remains bounded.

Oct 2012 – Feb 2013

Mechanical engineering intern, Makani Power · *Alameda, CA, USA*

Makani Power (now "Google Makani") is developing a kite-like airborne wind turbine. I contributed to the design and implementation of the Wing 7 ground station, a truck-mounted anchor, winch, perch, and power station. My work focused on the mechanical design of structural elements and chain drives. Rapid iteration meant designing parts in CAD, performing finite element analysis, and building prototypes in the machine shop.

June 2012 – Sept 2012

Archaeology intern, Fairfield Foundation. · *Gloucester, VA, USA*

Archaeological fieldwork at four colonial sites in Tidewater Virginia, involving surveying, digging, cleaning, interpreting, and mapping test units and shovel tests. Lab work involving sorting, cleaning, and cataloguing artifacts. I also did archival research on a historic estate, and helped renovate a 1920's gas station.

Fall 2010 – Spring 2011

Senior project, MIT Laboratory for Information Decision Systems · *Cambridge, MA, USA*

Designed and executed a year-long experiment, with Robert Han, under the guidance of Prof Moe Win. Applied machine learning techniques to ultrawideband radio waveforms to improve localization performance. Tested ability to identify the material of barriers possibly blocking the line of sight.

June 2010 – Sept 2010

Undergraduate research, MIT Technology Laboratory for Advanced Materials and Structures · *Cambridge, MA, USA*

Designed, machined, and tested a device to hold individual carbon fibers under tension inside a CVD furnace. Grew aligned carbon nanotube forests. Prepared carbon fibers with various coatings and tested their tensile strength. Prepared and cured graphite-epoxy composites.

June 2008 – Sept 2008

Undergraduate research, MIT Daylighting Lab · *Cambridge, MA, USA*

Coded a daylighting simulation plugin, as part of a team of 5 people, for SketchUp using Ruby and Java. Integrated code and equations from multiple master's theses. The plugin, 'LightSolve', calculated natural lighting characteristics and interactively assists with design optimization.

SKILLS

Languages	Java, C++, Python, Matlab · Julia, Haskell, Clojure, Arduino
Design	SolidWorks, Rhino, Siemens NX, SketchUp · Manual drafting, sketching, LaTeX
Machine Shop	Waterjet, MIG welder, 3D printer, lathe, mill, autoclave, forklift
Hobbies	Flying sailplanes · Drawing · Caving · Running · Swing dancing

June 15, 2017