Florian **Franzen**

Hard- and Software Engineer | Neuroscientist | Open Source Hacker

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Although I have received years of neuroscientific training and have worked on a broad range of mostly academic projects, I am a computer scientist and open source enthusiast at heart.

I have spent many years acquiring an extensive set of skills in hard- and software development, data analysis and machine learning, network and system administration, and full-stack web development in addition to reverse engineering.

Skills

Languages	English (fluent), German (native)
Programming	Bash, C, **C++**, CSS, haskell, HTML, Java, Lisp, Matlab, **Nix**, PHP, **Python**, Rust, SQL
Frameworks	Arduino, Asio, Boost, OpenCV, JUCE, jQuery, **Qt**, Teensyduino
Toolkits	Adobe Suite (Ps, Ai, Id), **CMake**, Git, Docker, Doxygen, LaTeX, IDA Pro
Administration	**Linux (Ubuntu, Arch, NixOS)**, OS X/macOS, Windows 7 & 8, hardware and network assembly
Manufacturing	CAD and 3D printing, circuit and PCB design, soldering

Professional Experience

May 2019 – Jan. 2019 | **Scientific Hard- & Software Engineer, Research Center caesar, Bonn, Germany**
User Interface for the synchronization and calibration of multi-camera setups, non-linear optimization of mutiple-view geometric graphs, refactoring and documentation of previous hard- and software work
C++ · CMake · Nix · Python · OpenCV · Qt

Dec. 2018 – July 2016 | **PhD Student in Neuroinformatics (departed), Research Center caesar, Bonn, Germany**
3-D reconstruction of environment and camera position from POV video data, design and implementation of ultra-lightweight tetherless recording platform for GPS, IMU and barometric sensor data, reverse-engineering and extension of consumer-grade 4k 360-degree camera for experimental recordings, multiple-view camera calibration, synchronization and tracking
Blender · C · C++ · CMake · Docker · IDA Pro · Jupyter · Matlab · Nix · OpenCV · Python · LSD-SLAM · Teensyduino

July 2016 – Nov. 2015 | **Network & System Administrator, Research Center caesar, Bonn, Germany**
Implementation of a new wired and wireless infrastructure for 200+ clients, including the configuration of firewalls, routing, switching, VLANs, 802.1x-based authentication, VPN, radius and SIP telephony
Bash · Cisco ASA · Cisco IOS · Cisco ISE · Cisco WLC · Microsoft Active Directory

2015 – 2014 | **Scientific Developer, MPI for Biological Cybernetics, Tübingen, Germany**
Optimization and extension of a variational inference algorithm for hierarchical hidden Markov models, design and implementation of new lab website, setup and maintenance of computing infrastructure
CSS · Foundation · HTML · JavaScript · Jekyll · jQuery · Matlab

Freelance Experience

2019 – 2018 | **Software and Network Engineer, White Matter LLC**
Porting of C++ API from WinSocket to cross-platform Asio library, extension of API with various functionalities (remote recording, multiple sessions, simulator, etc.), design of new binary network protocol incl. TCP streaming support, optimization of receiving, sending and forwarding performance to saturate Gigabit link, enforcement of thread safety and isolation, implementation of unit testing, update and extension of OpenEphys plugin
Asio · C++17 · Catch2 · CMake · Doxygen · fmtlib · JUCE · spdlog

2015 | **Software Engineer, Blackrock Microsystems LLC**
Addition of Blackrock file support to Neuroscope, support for live view of data from Blackrock recording systems in Neuroscope, various bugfixes and extension to Cerebus SDK, various bugfixes and refactoring of Neuroscope, setup of continous integration
C++ · CMake · Qt · Blackrock SDK

Education

2014 | **Master of Neural & Behavioural Science, International Max Planck Research School, Tübingen, Germany**
Thesis: "Evaluation of a Statistical Model for Cortical State Identification"
Advisor: Dr. Jakob Macke (Junior Research Group Leader, MPI for Biological Cybernetics)
Final grade: 2.1

2012 | **Bachelor of Cognitive Science, University of Tübingen, Tübingen, Germany**
Thesis: "Neural Circuits of Locomotor-related Response Modulation in Mouse Primary Visual Cortex"
Advisor: Dr. Laura Busse (Junior Research Group Leader, Centre for Integrative Neuroscience)
Final grade: 2.1

2009 | **High School Diploma (Abitur), Eichendorff-Schule, Kelkheim, Germany**
Majors: Biology and Mathematics
Final grade: 1.6

Publications

2018 A. Monsees, K.-M. Voit, **F. Franzen**, E. Leks, K. Scheffler, J. H. Macke, J. N.D. Kerr. Three-dimensional pose reconstruction of freely moving rats using anatomically informed modeling. *5th Bonn Brain Meeting*. 2018, Bonn, Germany

2014 P. Putzky, **F. Franzen**, G. Bassetto, J. H. Macke. A Bayesian model for identifying hierarchically organised states in neural population activity. *Advances in Neural Information Processing Systems 27*. 2014.

2013 A. Vaiceliunaite, S. Erisken, **F. Franzen**, S. Katzner, L. Busse. Spatial integration in mouse primary visual cortex. *J Neurophysiol*. 2013 May 29.

2011 S. Eriksen, S. Katzner, **F. Franzen**, L. Busse. Temporal structure of V1 population responses to stimuli of different contrasts. *Society for Neuroscience 41st Annual Meeting*; 2011, Nov 12-16; Washington, D.C.

Teaching

2015 | **Open Lab Ware Course, TReND in Africa, Addis Ababa, Ethiopia**
2 weeks | Building and calibrating delta-style 3D printers, CAD, electrical circuit design, microcontroller programming

2014 | **Tutor for Essential Mathematics, University of Tübingen, Germany**
1 term | For 1st term master students, weekly tutorial and graded homework assignments

2012 | **Tutor for Algorithms and Data Structures, University of Tübingen, Germany**
1 term | For 4th term bachelor students, weekly tutorial and graded homework assignments

Extracurricular

2018-2016 **Elected PhD Representative, Max Planck PhDnet, Research Center caesar**

2014-2010 **Member of Student Council, Department of Computer Science, University of Tübingen**

- 2014-2012 Officially appointed member of the Assessment Commission for Cognitive Science
- 2014-2010 Officially appointed member of the Study Commission for Cognitive Science
- 2010 Officially appointed member of the Appointment Committee for the Chair of Cognitive Modeling

2011-2010 **Member of Robotics Competition Team, Cognitive Systems, University of Tübingen**

- 2011 Member of *"Attempto Tübingen"* team, placed 5th of 22, Field Robot Event, Denmark
- 2010 Member of *"s'Tübinger Robotle"* student team, placed 8th of 16, Sick Robot Day, Germany