

Daniel M. Drucker, Ph.D. <dmd@3e.org>
Human factors, robots, data analysis, Unix, Python. Boston.

<http://3e.org>

- POST-PHD **Ab Initio Software** Lexington, MA 2016 –
Internal Consulting
I support our clients in their use of the Ab Initio ETL software and its underlying systems.
- Interactive Motion Technologies** Watertown, MA 2012 – 2016
Scientist, Software Architect
I developed software (Python, bash, Tcl/Tk, and C, on Linux) for FDA and CE certified robots that assist stroke and other patients with rehabilitation; I worked with clinical staff to design research-based treatment protocols and translate these into products. I made sure the robots followed Asimov's Laws of Robotics.
- Rewrote tens of thousands of lines of legacy Tcl/Tk code in (much less) Python
 - Developed software in C for an Atmel microcontroller, replacing the PLC in a new product line
 - Heavy use of IPython Notebook for simulation of robot behavior
 - Rewrote the central Xenomai-based real-time robot control loop to use a CANbus architecture
 - Redesigned software deployment mechanism, which had been based mostly on manual instructions and loose collections of shell scripts, to use modern Debian packages and containerization
 - Mentored junior programmers and interns
- Harvard, McLean Hospital** Belmont, MA 2015 –
Visiting Scientist (volunteer)
I assist researchers with data analysis and software toolchain development. I study researchers' workflows and suggest and implement improvements via shell and Python scripts.
- Design Science / Core HF** Philadelphia, PA (remote, consultant) 2010 – 2012
Usability Specialist
I focused on heuristic analysis, usability testing, statistics, data analysis, and background research in the service of medical device usability and safety, including human factors testing for regulatory approval. I specialize in applying principles of human psychology and cognitive performance to improving usability.
- PRE-PHD **AT&T Easylink, TransactPlus/JP Morgan, Bristol-Myers Squibb** 1999 – 2002
Lead, Network Operations; Systems Analyst
Developed tools to monitor Unix systems and networks. Supported Unix systems providing financial and other messaging services to 100,000+ customers in a high availability environment. Mentored programmers. Created formal documentation of procedures that had previously been passed down orally.
- EDUCATION **University of Pennsylvania**
Ph.D. 2009, Psychology (cognitive neuroscience).
I showed a new method of computationally modeling and analyzing functional neuroimaging data using multidimensional scaling-like methods, allowing researchers for the first time to detect certain very small scale properties of neural populations using non-invasive techniques such as fMRI and EEG. Code (primarily Matlab) written for my dissertation is available at github.com/dmd/thesis. In practice, I spent a great deal of time writing tools in Python and Matlab to manage long-running computation jobs to handle terabyte-scale datasets.
- I also had training in the theory of human decision-making: the science of how and why people and organizations make mistakes, and how to overcome these mistakes and make rational decisions instead.
- I am, in general, especially interested in how large quantities of information can be transformed in ways that allow people to quickly and accurately make decisions – whether that be by making computational tools to automate procedures so people can focus on higher-level concepts, or making simulations of large systems and datasets to help quantify how a particular experiment or change in behavior will turn out.

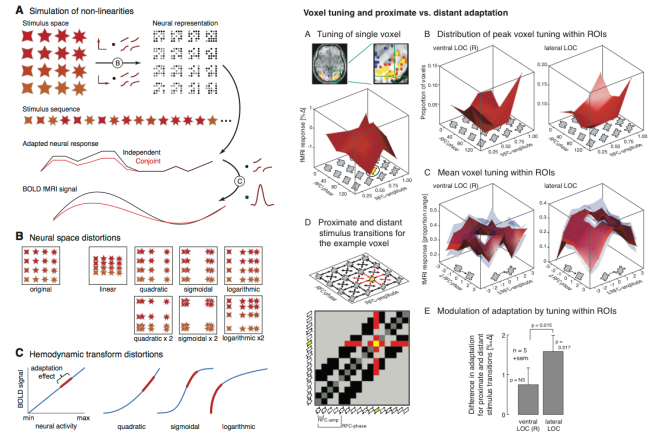
KEY PAPERS

Drucker DM, Kerr WT, Aguirre GK. 2009. *Distinguishing conjoint and independent neural tuning for stimulus features with fMRI adaptation.* J Neurophysiology. 3e.org/paper/dc i

Drucker DM, Aguirre GK. 2009. *Different spatial scales of shape similarity representation in lateral and ventral LOC.* Cerebral Cortex. 3e.org/paper/scale

I presented this research at the Society for Neuroscience and the Vision Sciences Society.

I am skilled and comfortable at presenting my and others' scientific and technical ideas to a broad audience.



EXTRAS

I am a licensed pilot and fly small sport aircraft; I contribute to numerous open source projects, submitting patches and participating in mainline development; I contradance and participate in other folk music events.

I have managed my own mail and other network services on Linux at 3e.org for more than 20 years. I have been using, programming, and administering Unix since 1991.