Daniel M. Drucker, Ph.D.

IT management · bioinformatics · neuroimaging · Unix · Python · ETL · robots · human factors

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Experience

IT Director, Imaging Center — Sr. Manager, Bioinformatics — Associate in Psychiatry

Belmont, MA

McLean Hospital — Mass General Brigham — Harvard Medical School

2019 - Present

- Set IT strategy and budgeting across clinical and research programs for the McLean Imaging Center; set mission, roadmap, and capacity plans for compute, storage, and networking.
- Architect resilient infrastructure with operational continuity; lead purchasing, capacity management, and lifecycle planning.
- Deliver enterprise backup & DR with on- and off-site replication supporting disk, machine, and site-level recovery.
- Build observability and QA: Zabbix-based real-time monitoring/alerting and trend-driven predictive models; performance metrics to forecast growth and utilization.
- Deploy modern imaging platforms including XNAT and Orthanc on TrueNAS + Proxmox; reproducible configuration-as-code; lossless ETL of images, metadata, and users.
- Develop reproducible neuroimaging pipelines: automated fMRIPrep workflows driven by declarative YAML.
- Maintain research computing: Red Hat + Bright/SLURM HPC; current imaging/system software; shared storage, backup, and networking for Core and Clinical Services; manage PACS and RIS.
- Virtualize services to reduce hardware footprint and improve agility and reliability.
- Direct desktop support operations: standards, processes, training; recruit, develop, and retain a high-performing team.
- Bridge IT and neuroscience as grant co-investigator: shape experimental design, build analysis software and data flows, interpret results, and contribute to publications; collaborate with external scientists.
- Partner with clinical and research stakeholders to refine workflows; evaluate and adopt emerging IT, data science, and imaging technologies to meet evolving community needs.

Internal Consultant

Lexington, MA

Ab Initio Software

2016 - 2019

- Supported clients, including many of the Fortune 50, in their use of the Ab Initio ETL software including the GDE, Co>Operating System, Control Center, Metadata Hub, and underlying systems.
- Built software solutions on Linux, Solaris, and AIX ranging from low-level system utilities to high-performance data processing engines operating over data warehouse systems spanning tens of thousands of database tables and hundreds of petabytes of data.
- Implemented systems to provide data lineage traceability and build systems that supply reproducible reporting.
- Taught internal classes in the use of our technologies and developed additional teaching materials to enhance existing classes.
- Managed and helped develop the internal Help system, which utilized open-source components such as nginx and Tomcat.
- Developed and maintained internal-facing dashboards (web-based and using custom designed hardware based on the Raspberry Pi and Arduino platforms) to support visualization and escalation.
- Started and managed a lecture series, “Brainfood”, wherein colleagues presented interesting scientific concepts, their thesis work, or anything else they found fascinating.

Scientist / Software Architect

Watertown, MA

Interactive Motion Technologies

2012 - 2016

- Developed software (Python, bash, Tcl/Tk, and C) for FDA and CE certified robots that assist patients with rehabilitation.
- Worked with clinical staff to design treatment protocols and translate these into products.
- Made sure the robots followed Asimov’s First Law of Robotics by implementing multiple redundant safety systems including software- and hardware-based power-off systems triggering on logical, electrical, and mechanical faults, with hard real time (<1 ms) decision time requirements.
- 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.
- Developed robot mechanical dynamics simulations in Jupyter/IPython Notebook.
- 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.

Usability Specialist

Philadelphia, PA

Design Science

2010 - 2012

- 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.
- Applied principles of human psychology and cognitive performance to improving usability.

Lead, Network Operations / Systems Analyst

NJ

AT&T Easylink, JP Morgan (TransactPlus), Bristol-Myers Squibb

1999 - 2002

At these three positions:

- Developed tools in Perl and shell to monitor Unix systems and networks.
- Supported Unix systems providing financial and other messaging services to 100,000+ customers in a high availability environment.
- Created formal documentation of procedures that had previously been passed down orally.

Education

University of Pennsylvania

Philadelphia, PA

Ph.D., Psychology (Visual and Cognitive Neuroscience)

2004 - 2009

Thesis: Neural Object Representation Spaces and their Metric Properties

- I showed a new method of computationally modeling and analyzing functional neuroimaging data using multidimensional scaling-like methods, and used it to differentiate between distributed and localized neural encodings.
- I wrote tools in Python and Matlab to manage long-running computation jobs and the operation of the Penn Center for Functional Neuroimaging cluster, and created a calendaring system to manage MRI reservations with complex business process requirements. I additionally took coursework 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.

Rutgers University

New Brunswick, NJ

B.A., Psychology and Cognitive Science

2003

Key Papers

- Drucker DM, Kerr WT, Aguirre GK. 2009. Distinguishing conjoint and independent neural tuning for stimulus features with fMRI adaptation. *Journal of Neurophysiology*. 3e.org/paper/dci
- Drucker DM, Aguirre GK. 2009. Different spatial scales of shape similarity representation in lateral and ventral LOC. *Cerebral Cortex*. 3e.org/paper/scale

Extras

- I am a licensed pilot and fly small sport aircraft; I contribute to numerous open-source projects; I contradance and participate in other folk music events. I have been using, programming, and administering Unix at 3e.org and elsewhere since 1991.