

Joshua Swearingen

Data science · AI · Scientific engineering

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Data scientist and scientific engineer with experience in machine learning, physiological signal processing, research analytics, and software development. Background spans wearable sensors, scientific information systems, experimentation, and early-stage AI applications. Ph.D. in neuroscience, with research in the temporal dynamics of functional brain networks.

SELECTED EXPERTISE

- **Data and AI:** machine learning, NLP, topic modeling, LLM applications, time-series analysis, forecasting, and dimensionality reduction.
- **Scientific engineering:** signal processing, filtering, artifact detection, feature extraction, calibration, and predictive modeling.
- **Product and research:** experimentation, A/B testing, personalization, network analysis, and data visualization.
- **Selected tools:** Python, SQL, Pandas, scikit-learn, PyTorch, MongoDB, Elasticsearch, AWS, Flask, FastAPI, Docker, Plotly Dash, and Superset.

PROFESSIONAL EXPERIENCE

Infocean LLC | Data science and software consulting

Consulting since 2016; selected engagements below

Data science and software consulting across medical-device algorithms, marketing and e-commerce forecasting, health and behavior applications, and large language models. Selected engagements include Alertgy (2023-2024), All Turtles (2019-2020), Vitality (2020), Versame (2017-2018), and Ambitrace (2018), alongside work with Sano and Sovereign described below. LLM work has included tools for news and education services.

Sovereign | Head of Data Science

May 2020 - November 2021

- Led analytics and data science across a marketing technology portfolio including CompareCredit, businessloans.com, and RateQuote.
- Created an experimentation platform to inform engineering, design, and marketing decisions.
- Developed personalization and product-ranking models to identify higher-performing products and support revenue improvement.

Digital Science / UberResearch | Senior Data Scientist

June 2019 - September 2020

- Led projects for research organizations, including the NIH, using the Dimensions scientific information platform.
- Applied large-scale NLP, topic analysis, network analysis, and visualization to millions of research publications and grants.
- Built custom software and analyses for government and private institutions beyond the platform's standard product features.

Sano | Data Scientist

May 2015 - June 2016, full-time; February 2018 - February 2019, contract

- Developed online algorithms to filter, transform, and calibrate sensor measurements for blood-glucose prediction.
- Worked with R&D to improve sensor sensitivity, reduce noise, and identify and filter measurement artifacts.

Bodyport | Senior Data Scientist

June 2016 - August 2017

- Led algorithm development ahead of FDA submission for a novel cardiac sensing device.
- Developed filtering, anomaly detection, feature extraction, calibration, and ensemble models to characterize cardiac status and predict blood pressure.

EDUCATION AND RESEARCH

Ph.D., Neuroscience | Medical University of South Carolina

2015

Dissertation: *Characterizing the temporal dynamics in functional connectivity measured with fMRI*. Applied spectral learning and dimensionality reduction to model changing brain-network activity in high-dimensional time series, and investigated network variability during rest and visual stimulation.

Additional research included computational modeling of temporal perception in cortico-striatal networks and seizure classification using intracranial EEG.

B.S., MB3 (Molecular Biology, Biochemistry, and Bioinformatics) | Towson University

INDEPENDENT WORK

Thoughtlines - An interactive philosophy atlas combining source-linked records, graph exploration, and guided readings. An independent project connecting research, data organization, and browser-based exploration.