Stuart Synakowski

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Summary

Senior data scientist specializing in, machine learning, computer vision, & generative AI orchestrations.
Hands-on leader with a track record of building AI platforms that transform corporate research.
Skilled in first-principles thinking, ML, and managing others to deliver AI solutions with business impact.
Looking to solve meaningful real-world problems with other hardworking individuals.

Work Experience

Senior Data Scientist at Procter & Gamble | *R&D — Discovery and Innovation Platforms* 2024-Present
- GenAI Assisted Research Platforms & AI Solutions to Accelerate Skin Research

Data Scientist at Procter & Gamble | *R&D—Data And Modeling Sciences* 2022-2024
- Computer Vision Systems to Accelerate Product and Consumer Research

Graduate Researcher at The Ohio State University | *Electrical and Computer Engineering-CBCSL* 2017-2021
- Computer Vision & Machine Learning Researcher & Teacher's Assistant

Custom GenAI Platforms for Research

Democratizing Text Mining for Domain Experts | *P&G* 2024-2025
- Recognized the limitations of chatbot style LLM tools for clinicians and product researchers within P&G
- Created LORO, a low-code tool to democratize lang-chain style text processing workflows
- Domain specific text mining and structuring solutions are now enabled for anyone within P&G
- Consolidated decades of clinical research findings into a single table for easy wholistic analysis
- Consumer data like reviews and vlogs are easily tabulated to quickly assess distributions of thought

Effective Comprehensive Analysis On Large Amounts of Text | *P&G* 2024-2025
- Observed limitations of RAG to effectively perform comprehensive analysis on large amounts of text data
- Created the Generative Omni-Analysis Tool (GOAT) leveraging GenAI for text fused in tabular data structures
- Demonstrated the tool's utility for searching, hypothesis generation, and analysis of large amounts of text
- Applied tool to multiple business units from consumer research and marketing to clinical and chemical research
- For each application months worth of analysis is performed seconds in ways that can be validated and quantified

Computer Vision Capabilities to Better Understand Skin

Generating Images to Understand the Perception of Skin Appearance | *P&G* 2023
- Created a synthetic image generation platform for consumer skin perception studies.
- Replaced reliance on costly real-world controlled data collection of skin images

A Universal Metric for the Perception of Skin Ailment Severity | *Procter and Gamble* 2023
- Co-developed SK-distance, a universal metric for skin ailment severity.
- Outperformed prior methods in quantifying post-inflammatory hyperpigmentation.

Lab Quality Images at the Subject's Home | *P&G* 2023
- Developed frameworks to improve the quality of images taken by subjects for clinical research
- Expanded analysis from facial imaging to whole-body ROI tracking, including complex regions, enabling broader clinical study applications for product development

Learning to Predict Treatment Response to Olay Skin Products | *P&G* 2023
- Demonstrated we can predict response to skin treatments from an image of the face and face alone
- We demonstrated the potential to deliver customized products to deliver superior performance

Computer Vision to Better Understand Consumers

Augmenting Pamper's Diaper Fit Finder Application for the iPhone Pro | *P&G* 2023
- Prototyped a Lidar based system using the iPhone pros to measure babies for products research

Automating Micro-Action Analysis of Consumers Shaving for Gillette | *P&G* 2023
- Designed a computer vision system to quantify shave micro-action statistics for PR/CR teams

AI Research Experience

Understanding the Structure of Deep Neural Networks that Learn | *Graduate Research* 2019-Present

- Desired a framework to understand the structures consistent with learning in Deep Neural Networks (DNNs)
- Examined the structure of DNNs using Topological Data Analysis (TDA)
- Designed a novel topological characterization of DNNs: (available on arxiv)
- Demonstrated its applications in performance estimation, meta-learning, and task-similarity

Higher-Level Action Analysis Research | *Graduate Research* 2017-2020

- Desired an interpretable method to infer between intentional and non-intentional movement in videos
- Developed an unsupervised algorithm to detect non-intentional movement in videos using common knowledge
- Demonstrated algorithm can be applied to any agent, ranging from cartoons to humans
- Published work in The International Journal of Computer Vision, algorithm is now public (see github)

Technical Skills

Computer Vision & Image Processing(Solid Understanding and Real World Experience with the following)

- Camera Models
- Multi-view geometry
- Structure from Motion
- Point-set Registration
- Photogrammetry
- Optics
- Radiometry
- Low-level Processing
- Color Models
- Computer Graphics
- Inverse Rendering
- Facial Recognition
- Action Recognition
- Augmented Reality
- Image Segmentation
- Anomaly Detection

Large Language Models and Generative AI (implementation & deployment experience)

- Training & Fine Tuning
- RAG Systems
- Diffusion Models
- Prompt Engineering
- LangChain Pipelines
- AI Agents
- LLM Evaluation Protocols
- Model Compression

Deep Learning (Solid Understanding and Technically Equipped to implement any of the following)

- MLPs
- CNNs
- Transformers
- Adversarial Networks
- AutoEncoders
- Optimization Strategies
- Regularization Techniques
- Data Augmentation

Classical Machine Learning: (Spent many years achieving a deeper understanding of the following machine learning concepts)

- Learning Theory
- Decision Theory
- Generative Models
- Discriminate Models
- Graphical Models
- Classification
- Regression
- Kernel Methods

Fundamentals In Mathematics, Statistics and Physics: (Well-versed in the following fields of mathematics)

- Linear Algebra
- Probability
- Statistics
- Optimization
- Computational Topology
- Graph Theory
- Differential Equations
- Numerical Methods

Programming, Developer Tools and Libraries (Preferred)

- Python 3
- Pytorch
- LangChain
- Git
- Docker
- Conda
- Pip
- Linux/Unix
- Azure
- Databricks
- Streamlit
- Vim & VScode

Domain Expertise in AI Applications (Spent Many Months Reviewing Domain Applications)

- Dermatology
- Sustainability
- Consumer Research
- Clinical Research

Education

Ph.D. Electrical and Computer Engineering 2017 - 2021
The Ohio State University (Computational Biology and Cognitive Science Lab) *Columbus, OH*

- Specializing in **Computer Vision**, **Machine Learning**, and **Mathematical Modeling**

B.S. Physics, B.S. Applied Mathematics and Statistics (Dual Degree) 2013 - 2017
Clarkson University Computer Science Minor, Presidential Scholar *Potsdam, NY*

Continued Learning

AI Conferences: Regular attendee of CVPR, ICCV, ECCV, NeurIPS. Data Science Certification: Completed Data Science Dev Level 2 at P&G. Mastering AI Pipelines: Studying LangChain, RAG, and AI deployment strategies.

Interests and Hobbies

Jazz Drumming, Snowboarding, Brazilian Jiu Jitsu, Hiking, Building Computers, Racing Drones, Stand-up