

Matthew Barty

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UX & HF Engineer | Data Scientist | Applied AI

 [Mattbarty.com](https://mattbarty.com)

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8+ years of professional **UX / Human Factors** experience in MedTech, designing hardware and software interfaces for: soft-tissue robotics (Versius), neuro-stimulation implants, digital health platforms, prostheses and more. Self-taught **Frontend Developer**, **Data Scientist**, **ML/AI Tinkerer**, and prolific developer advocate.

| Education

MSt Healthcare Data Science	University of Cambridge, UK	2020 – 2022
BSc UX, Ergonomics, & Human Factors	Loughborough University, UK	2014 – 2018

| Hackathons

“Vox Populi” – Conversational Agent RPG Sandbox | ElevenLabs London (🏆 Winner) [@LinkedIn](#)

NextJS, ReactJS, ThreeJS, ElevenLabs Conversational AI / TTS api, gpt-4o-mini api

- Developed 3D sandbox game enabling dynamic speech interaction with AI agents in a 24-hour timeframe
- Built custom game engine in ThreeJS to facilitate unique AI autonomy and voice-driven gameplay

“Guess Who” – Conversational AI Guessing Game | Speechmatics Global (🏆 Winner) [@LinkedIn](#)

NextJS, ReactJS, ThreeJS, Speechmatics FLOW api, gpt-4o-mini

- Reimagined the classic "Guess Who" game using Speechmatics' conversational AI Flow API
- Built interactive web interface with real-time speech recognition and character identification
- Engineered dynamic game logic combining speech recognition with AI character reasoning

“LlamaXpat” – Interactive Career Atlas | Meta London [@LinkedIn](#)

NextJS, ReactJS, MapBox, Llama-2.1, Groq api

- Created AI-powered career exploration platform combining interactive maps with LLM-driven country insights within 24-hour hackathon constraint with focus on performance and user experience
- Implemented Llama-2.1 model through Groq for fast, contextual career advice based on location selection

“Prompt Olympics” – Interactive GenAI Event | AI Tinkerers Kuala Lumpur (organizer) [@AITinkerersKL](#)

NextJS, ReactJS, ThreeJS, Speechmatics FLOW api, gpt-4o-mini

- Contributed to the organization and game design of KL's largest AI Tinkerers event (120+ attendees),
- Design interface Olympics dashboard, leaderboard and a unique chat-driven charades game with an LLM

| Talks & Presentations

- **‘Creative AI: The Latest in Generative Art, Music, and Videos’** – Internal presentation going over the state-of-the-art generative models and how they could be leveraged for creative output.
- **‘A Brave Neural World’** – Keynote speaker and panelist at Digital Health World Congress, London 2023, discussing ‘AI as a Tool for Accessibility in HealthTech’.
- **‘GenAI Upskilling for Business/Creative Applications’** (internal) – Driving AI strategy at TTP through organizing Lunch & Learns, trialing enterprise platforms, performing developer advocacy (coding club), and leading GenAI skunkworks initiatives

Brain Tumour Categorical Classifier

[@Github](#)

Python, TensorFlow, Keras, OpenCV (cv2), NumPy, Pandas, Matplotlib, scikit-learn, PIL

- Uses Convolutional Neural Networks (CNNs) to analyze MRI scans of the brain and classify them according to the type of tumor present, if any
- Achieves strong predictive classification (validation accuracy: 63%, test accuracy: 69%, F1-Score: 0.857)
- Built using TensorFlow and Keras, leveraging a pre-trained EfficientNetB0 architecture with transfer learning
- Incorporates advanced image preprocessing with contour detection to accurately isolate brain tissue

Augmented Reality, Real-Time Sudoku Solver

[@Github](#)

Python, TensorFlow, OpenCV (cv2), matplotlib, NumPy, PIL

- Trained OCR model on MNIST dataset to recognize handwritten digits in Sudoku puzzles
- Implemented real-time grid detection with perspective transformation to extract puzzles from webcam
- Built efficient backtracking solver with threading for performance optimization
- Created AR interface that overlays solved digits onto original puzzle in live camera view
- Added stability features like motion detection and confidence thresholds to improve reliability

Medical Device Safety Database & RAG System ("Maude Search")

Internal Proj.

Python, NextJS, React, Typescript, FastAPI, gpt-embedding, NumPy, FAISS (meta vector DB)

- Initiated project to embed 50,000+ adverse event reports for MedTech research, focus on surgical robotics
- Created RAG-based search system for identifying use errors and automating trends analysis
- Presented at PODD 2025 with proven research efficiency improvements
- Currently in trials showing significant gains in human factors engineering research

AI Generated Music Video

[@LinkedIn](#)

Midjourney (Generative Diffusion), Luma (img2vid), Suno (txt2Music), Photoshop, Premiere

- One of the first fully AI-directed music videos just days after public release of txt2vid technologies
- Produced video with 100% AI-generated visuals and music using cutting-edge generative models
- Developed techniques for maintaining character consistency between video scenes
- Demonstrated practical workflow combining multiple AI tools into cohesive creative output

GenAI Augmented Product Design (Stable Diffusion) & Marketing Campaign

[@LinkedIn](#)

Stable Diffusion, Photoshop, auto-photoshop-stable-diffusion-plugin (open-source)

- Established proof-of-concept for AI-assisted product design that improved efficiency and creativity of product design workflow (local stable diffusion + photoshop)
- Led campaign gathering designer and artist feedback on AI integration in creative processes
- Produced marketing content demonstrating AI-augmented design capabilities and benefits
- Video success influenced marketing team's 2024 public communications strategy

| Professional Experience

UX, Human Factors Engineering, & Applied AI Consultant

2022 – Present

@ [The Technology Partnership \(TTP\)](#) | *World-Class Technology & Design Consultancy*

- Generated over £600k in consulting fees through leading HFE workstreams during the development of class ii & class iii MedTech system (e.g., surgical robotics, neurostimulation implants, ocular implants, etc.),
- Experience writing formative and summative (validation) usability study protocols and HFE / UE reports
- Experience writing Risk management documentation including user requirements specification, uFMEA, and preliminary hazards analysis documents
- Frontend research experience conducting early-stage Task Analysis, Heuristic Analysis, product landscaping, and stakeholder interviews / assumptions testing

Human Factors Engineer & Clinical Data Scientist

2018 – 2022

@ [CMR Surgical](#) | *Surgical Robotics Unicorn (startup experience, \$3bn valuation)*

- Moderated successful full validation study of complex surgical robotics system ('Versius'),
- Planned, moderated, and reported on successful instrument reprocessing usability study
- Lead, designed, and executed 40+ smaller usability and clinical engineering studies for complex surgical hardware, and software features,
- Designed algorithms and systems that programmatically reviewed risk management documentation for inconsistencies, errors, or to ensure study protocols adequately covered relevant risk items
- CMR's first data scientist and responsible for programmatically processing novel, semi-structured real world clinical evidence