

Natanel Richey

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[Portfolio](#) | [LinkedIn](#) | [GitHub](#)

Summary

Software-developer skilled in Python and JavaScript focused on Applied Machine Learning and Web/App Design Experience in training AI models, building full-stack websites, data analysis (AI enhanced). Methodical and analytical, hard-working and efficient, fast-learning, hungry for excellence and passionate about bridging the gap between human and machine intelligence.

Professional Experience

Machine Learning Engineer, BabyClue · Part-time

Nov 2025 - Present

Built and evaluated a multi-class infant-cry classification pipeline, focusing on robust validation, interpretability, and reproducibility.

- Developed end-to-end ML evaluation workflows in Python
- Ran rigorous, comparative model testing using nested CV with fold-level and aggregated analysis (macro/micro F1, per-class precision/recall/F1, confusion matrices, latency) to reliably determine which approaches generalized best across splits
- Built the full training pipeline combining audio preprocessing (spectrogram-based features / AST embeddings), data augmentation, feature construction (late-fusion of embedding + acoustic features), and model training/inference across multiple model families (e.g., MLP, LightGBM, plus classical baselines like SVM/Nearest Centroid where applicable)
- Engineered prompt variants for LLM classification (Chain-of-Thought, Tree-of-Thought variants), systematically compared API responses across providers, evaluating reasoning quality, and refining prompt structure and routing logic to reduce token costs while refining performance

Education

BSc. in Computer Science, B.A. in Psychology (Hons.)

2021 - 2025

Hebrew University of Jerusalem, Jerusalem, Israel

Technical Skills

- **Languages:** Python, JavaScript, TypeScript, SQL, C, C++, Java
- **Tools:** Cursor + CLI, MCP, skills.md, Git, Docker, Postman, Cloudinary, Vercel
- **AI/ML:** TensorFlow, PyTorch, Scikit-learn, HuggingFace Transformers, LoRA Fine-tuning, Hyperparameter Tuning, RAG implementation, Model APIs, NLP, LangChain, Sentiment Analysis
- **Frontend:** React, Next.js, Tailwind CSS, HTML/CSS, Framer Motion
- **Backend:** Node.js, Express, MongoDB, PostgreSQL, REST APIs, React Query
- **Other:** OOP, Operating Systems, Algorithms and Data Structures, Statistics and Computational Methods, Data Science, PWA, Web Scraping

Projects

TheraBot - Fine-tuned AI Model

Fine-tuned Llama model using HuggingFace Transformers with LoRA ranking on therapy conversation datasets.

[GitHub](#) | Demo available upon request

- RAG implementation using FAISS vector store with E5 embeddings
- Weights & Biases experiment tracking and model monitoring
- Deployment on HuggingFace Spaces and Google Colab with GPU acceleration

MealCreator - Full-Stack React Website

A full-stack Progressive Website for meal planning and pantry management.

[GitHub](#) | Demo available upon request

- Real time data sync using React Query with optimistic updates and intelligent cache invalidation, reducing API calls by 80%+
- TypeScript implementation across Next.js components, RESTful backend API, MongoDB and Mongoose schemas