

# 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 2024 - 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)

## 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 (Python, AI Model Training, LoRA Fine-tuning, NLP, RAG implementation) – [GitHub](#)

| Demo Available on Request

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

- 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 (Next.js, TypeScript, MongoDB, React Query, Cloudinary, Vercel, PWA) –

[GitHub](#) | Demo Available on Request

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

- 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