

VIVEK JOSHY

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OPENSkill

Bayesian Multiplayer Rating Library

2024

Open-source Bayesian rating library for asymmetric multi-team, multiplayer matches, implementing the Weng–Lin models with extensions. Published in the Journal of Open Source Software; preprint on arXiv since January 2024. Independently ported to 7 languages by other people, and cited 11 times including in IEEE Transactions on Games, COLING, and the Journal of the Royal Statistical Society. Pinned as a dependency in Ray/RLlib and the rating layer in Neural MMO, both checkable in those projects' dependency manifests; also in production use at OpenAI, MultiVersus, Hunt: Showdown, and BeyondAllReason, and the rating engine behind the Vairified platform.

openskill.me • github.com/vivekjoshi/openskill.py • DOI: 10.21105/joss.05901 • [arXiv:2401.05451](https://arxiv.org/abs/2401.05451)

PROFESSIONAL EXPERIENCE

Vairified Corp

January 2025 – Present

Lead Scientist, Data & ML

Naples, Florida

- Own the backend ML platform: shipped the Partner API to production behind OAuth and scoped API keys, with maintained Python and TypeScript SDKs.
- Built VAIR, the production rating engine: Thurstone–Mosteller via OpenSkill, with score-margin weighting and adaptive uncertainty.
- Built Sentinel: extracts implicit business logic from three codebases by AST analysis and renders it in natural language for non-engineer review — the interpretability problem in miniature, on a real system.
- Led the legacy PHP migration off a 184-file codebase.
- Delivered multisport sport-filtering end to end, from schema through cross-sport search to per-sport rating buckets.

Pickleball Players Network

October 2023 – December 2024

Data Scientist

Los Angeles, California

- Created matchmaking algorithms and skill assessment models.
- Built prototype system using Python and PostgreSQL.

Open Source Development

2016 – Present

- Maintain OpenSkill, a peer-reviewed Bayesian rating library with production deployments across games and sports.
- Contributed role icon support to [hikari](#), a Python Discord API library (merged, 2021).

RESEARCH

Boundary Kernel Theory & Grammar Induction

In progress

Monograph in progress; the line of work runs back to OpenGrammar (2022). Open quantities: k^* , the interaction order, and the renormalizability conjectures.

ARC-AGI

Ongoing

Two years across eighteen solver architectures in nine families. Finding: the binding constraint is object-level relational structure that is not recoverable from pixel context — not compute.

TECHNICAL PROJECTS

NeurIPS 2024 — Predict New Medicines with BELKA

2024

- Silver medal: 61st of 1,950 teams.

- Implemented domain adversarial training with gradient reversal.
- Designed a custom molecular data processing architecture.

SAT/SMT Solver 2024

- Built CDCL -based reinforcement learning system for SAT/SMT problems.
- Custom rewards created for efficient solution space exploration.

Prompt Ensemble Framework 2024

- Built an entropy -based framework for token evidence aggregation.
- Created logarithmic pooling for confidence scoring.

COMMUNITY

Theoretical Neuroscience Community Present

Owner and administrator of discord.gg/neuroscience, the largest theoretical neuroscience community on Discord, with over 6,940 members.

Machine Learning Street Talk Present

Expert role on the MLST community server.

The Hitchhiker's Guide to Python 2017

Contributed to Common Gotchas chapter (docs.python-guide.org)

SKILLS

Technologies: PyTorch, Polars/Pandas, FastAPI, Ray/RLlib, TypeScript, NestJS

DevOps & Data: Git, Docker, AWS, GCP, PostgreSQL, MongoDB, TypeDB, RDF/SPARQL

Core: Formal Methods, Grammar Induction, Neuro-Symbolic Computation, Interpretable AI, Bayesian Inference

EDUCATION

Mahatma Gandhi University 2024

Bachelor of Science in Bioinformatics Aluva, India