Amit Singh

Machine Learning Research Engineer

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Education

Computer Science and Engineering

SRM Institute of Science and Technology.

2018-2022 Kattankulathur, TN

B.Tech in Computer Science and Engineering with specialization in Information Technology.

Senior Secondary Education

Ahmedabad Public School International (CBSE)

2017 Ahmedabad, Gujarat

Secondary Education

Delhi Public School Gandhinagar

2015 Gandhinagar, Gujarat

Organizational Experience

Machine Learning Research Engineer & Product

Paperplane Communications Private Limited

June, 2021-Present Bengaluru, Karnataka

- We at Paperplane have onboarded 3,000+ doctors who have completed 120k+ appointments for 600k+ patients.
- Developed a **Graphical Recommendation Engine** which has assisted doctors to write **5,000 Digital Prescriptions under 20 seconds** via AI nudges without ample clinical data to start with.
- Implemented and deployed **Transformer Network with Attention-block** from scratch to **detect intent behind the patient's query in natural language over WhatsApp** and respond with result **in real time (<100 ms).**
- **Trained a Sequence-to-Sequence Transformer** to generate promotional marketing content for doctors. **I trained this model on synthetic data generated by the model itself** and its **weights were quantized from 750 million to 120 million parameters at deployment for inference under 5 seconds.**
- Built **Data Pipelines and Embeddings for Continual Learning** of the models.
- I built and deployed all this by myself **without any 3rd party APIs** and **between 1.5 to 2 years before ChatGPT and LLM moment.**
- I led Design team for first iteration of the product while working on the UX.
- Also, worked sporadically on Sales, Growth. From closing deals to communicating user-feedback loops.

Advanced Research Group Member

Active Inference Lab, California, USA

Jan, 2021-Sept, 2022 Remote

- Studied **how intelligence emerges**, or in other terms how particular systems develop the ability to do so. I **developed the Mathematical formulation behind this**. Read here (My research pseudonym is "metamyth").
- Developed **cognitive frameworks mathematically** to **incentivize people with intrinsic motivation** in an organization **with web3 substrate.**

Chair, SIGAI ACM, SRM Student Chapter

June, 2019-Sept, 2020 Kattankulathur, TN

- Implemented various Machine Learning and undertook various projects, organized workshops/research talks mentoring my peers to develop leadership qualities.

Skills

Programming, Frameworks and Libraries:

C, C++, Java, Python, R, PyTorch, Tensorflow, Keras, JAX, TF Probablity, PyTorch Geometric, NumPy, Pandas, MongoDB, Neo4j, Git, Linux, Flask, FastAPI

Research Publications

- **Context Switching in Machine Minds** at **Society of Mathematical Psychology 2021**
  A novel approach a neural network trained to navigate across all task manifolds in the state space, learning a meta-manifold. More in my talk here.
- **Collective Intelligence as Latent Imagination** at **International Conference on Cognitive Modeling (ICCM 2021)**
  Complexity increases when considering collective behaviour, raising questions whether group intelligence is merely the sum of individual intelligences or a unique attribute. The proposed latent model framework, using active inference as an intrinsic reward mechanism and statistical state models provides a comprehensive approach to generalize cognition across scales. Read open-sourced extended abstract here at Pg. 73.
- **Evolution of Latent Model for Collective Cognition** at **Cognitio 2021, Institut des Sciences Cognitives UQAM, Montreal, Canada**
  A framework to describe how societies grow from fractured cities to interconnected metropolis and use this analogy to describe evolution of collective intelligence. More in the talk here.
- **Decentralized Science: from Situated Sensemaking to the Epistemic Commons (with Co-Authors)**
  This work explores the intersection of blockchain technology with decentralized science (DeSci), viewing science as a collective process modeled using Active Inference. An ontology named Active Entity Ontology for Science (AEOS) is presented, offering a composable, versionable system for modeling various scientific systems using Active Inference entity partitioning. Paper here.
- **Active Blockference: cadCAD with Active Inference for Cognitive Systems Modeling** at **4th International Workshop on Active Inference, Ghent, Belgium (with Co-Authors)**
  An approach in cadCAD simulations to model dynamics and inference in Cognitive Systems integrated with the fore-mentioned AEOS Ontology in the previous paper, starting from mathematical foundations to tangible computational simulations.