Pune AI Community Mentorship Scheme

Yogesh Haribhau Kulkarni

YHK

Outline

Mentorship Overview

YHK

AI Community Projects

- ▶ Driven by Pune AI Community (PAIC) Team
- ▶ Project-based, hands-on AI mentorship and collaboration
- ▶ Focus on real-world systems: RAG, Knowledge Graphs, LLMs, Geometry
- ▶ Voluntary, non-monetary, unpaid learning collaboration
- ▶ Contributions via GitHub pull requests
- ▶ High-level guidance; learning by building
- ▶ Opportunities for talks and research papers

YHK

Contribution Guidelines

- Voluntary, unpaid, non-commercial contribution
- No job or internship guarantees
- Contribute via GitHub pull requests
- Expect minimal hand-holding
- Match skills or willingness to learn required stack
- Collaboration may lead to talks or papers

YHK

How to Join

- Email project lead with correct subject line
- Include GitHub profile or relevant work
- Engage through PAIC community channels
- Learn by building and collaborating

YHK

Ask Yogasutra

Repo:
https://github.com/yogeshhk/Sarvadnya/tree/master/src/ask_yogasutra

Overview

- AI system to explore Yogasutra of Patanjali
- Combines original sutras, translations, commentaries
- Knowledge Graph: Sutras as nodes, relations as edges
- Streamlit-based graph visualization
- RAG-powered chatbot for Q&A
- Planned GraphRAG for multi-hop reasoning

YHK

Technical Focus

- Graph data modeling and ontology design
- Retrieval-Augmented Generation pipelines
- GraphRAG for complex, multi-hop queries
- LLM orchestration and prompt engineering
- Streamlit UI integration
- Research-oriented experimentation

YHK

Skills & Participation

- Python programming
- LangChain / LlamaIndex experience
- Knowledge Graphs and RAG systems
- Interest in GraphRAG and reasoning
- GitHub-based collaboration
- Interest in co-authoring research papers

YHK

MidcurveNN: Neural Midcurve Generation
Repo: https://github.com/yogeshhk/MidcurveNN

Overview

- GitHub repo: MidcurveNN – neural network for midcurve of shapes
- Problem: compute midcurve of 2D closed polygon shapes
- Uses neural networks for geometric dimension reduction
- Input: polygon pts/lines; Output: midcurve representation
- Architecture: encoder-decoder style models
- Skills: Python, neural networks, CAD geometry
- Research focus & benchmarking

YHK

Technical Focus

- Geometric representation challenges
- Modeling variable-length graph input/output
- Experimentation w/ encoder-decoder nets
- Potential integration with LLM fine-tuning for shapes
- Contributions: algorithms, training data, metrics
- Suitable for geometry + ML experienced contributors

YHK

Geometry-Aware LLM Fine-tuning

- Research-focused LLM fine-tuning project
- Goal: Generate midcurves from 2D closed shapes
- Geometry represented using text-based BREP format
- Treats geometry as machine translation
- Avoids image-based noise; exact point outputs

YHK

Why Fine-tuning?

- No existing LLMs can generate midcurves
- RAG unsuitable for geometry embeddings
- Fine-tuning enables task-specific learning
- Improves geometric consistency
- Supports few-shot vs fine-tuned comparisons

YHK

Technical Work

- Custom dataset creation for geometry
- LLM fine-tuning workflows
- Transformer-based training pipelines
- Ludwig / HuggingFace style experimentation
- Evaluation, benchmarking, research analysis

YHK

Skills & Resources

- ▶ Prior experience with LLM fine-tuning
- ▶ Python and ML pipelines
- ▶ Interest in CAD / geometry / engineering AI
- ▶ GitHub collaboration
- ▶ Kaggle datasets, notebooks, GitHub repo provided

YHK

Mining Resume

Repo: https://github.com/yogeshhk/MiningResume

Overview

- ▶ Focus: Extract fields from resumes (text mining)
- ▶ Core tasks: parse contact, skills, education, experience from resume data
- ▶ Optional: Build a knowledge graph for resume info & querying
- ▶ Ideal for NLP + data extraction workflows
- ▶ Skills: Python, NLP tooling (spaCy/NLTK), regex text processing
- ▶ Outputs: structured resume fields for chatbot/analytics
- ▶ Collaboration via GitHub PRs

YHK

Technical Focus Areas

- NLP parsing pipelines for unstructured resumes
- Entity extraction: name, email, skills, companies
- Mapping resume fields to structured schema
- Knowledge graph nodes & relations for people/skills
- Dataset cleaning and text normalization
- Optional visualizations or search interfaces

YHK

Sarvadnya: RAG Systems Collection

Repo: https://github.com/yogeshhk/Sarvadnya

Overview

- Collection of proof-of-concept RAG systems and integrations
- Targets RAG over diverse document modalities & corpora
- Skills: Python, LangChain/LlamaIndex, vector stores, embeddings
- Focus: Build retrieval pipelines + query UIs
- Contributions via extensions, new modalities, improved retrieval

YHK

Skills & Use Cases

- Implement RAG for PDFs, text collections, multi-modal content
- Integrate with LLMs for answer generation
- Handle chunking, embeddings, semantic search
- Build UI for query & response (chat, dashboards)
- Evaluate retrieval quality and LLM grounding
- Ideal for contributors experienced in LLM pipelines

YHK

Overview

- Python implementation inspired by The Nature of Code series
- Focus: physics and ML animations in Python
- Covers simulation, generative visuals, interactive models
- Mix of mathematical models and creative coding
- Skills: Python, NumPy, animation frameworks
- Contributions: add physics models, improve visuals
- Potential for linking simulations with ML datasets

YHK

Technical Traits

- Physics simulations (forces, motion, interactions)
- Generative animations and visual outputs
- Python-centric algorithm implementations
- Useful for ML-augmented animation prototypes
- Educational and exploratory codebase
- Extendable with ML/AI agents or visualization UIs

YHK

Thanks

YHK

Pune AI Community (PAIC)

- Two-way communication:
    - Website puneaicommunity dot org
    - Email puneaicommunity at gmail dot com
    - Call + 9 1 9 8 9 0 2 5 1 4 0 6
    - LinkedIn:
      https://linkedin.com/company/pune-ai-community
- One-way Announcements:
    - Twitter (X) @puneaicommunity
    - Instagram @puneaicommunity
    - WhatsApp Community: Invitation Link
      https://chat.whatsapp.com/LluOrhyEzuQLDr25ixZ
    - Luma Event Calendar: puneaicommunity
- Contribution Channels:
    - GitHub: Pune-AI-Community and
      puneaicommunity
    - Medium: pune-ai-community
    - YouTube: @puneaicommunity

Website

YHK

Website

Medium Blogs

Twitter-X

LinkedIn Page

Github Repository

WhatsApp Invite

Luma Events

YouTube Videos

Instagram

YHK