

ResearchRadar

hackOMSCS 2024

Ollie

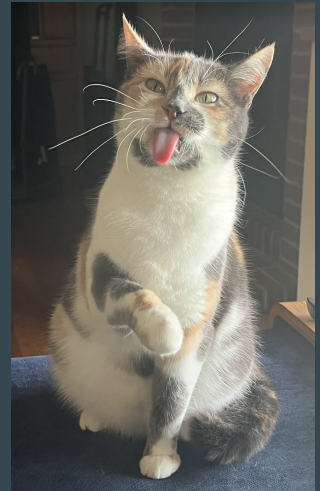


Anubha



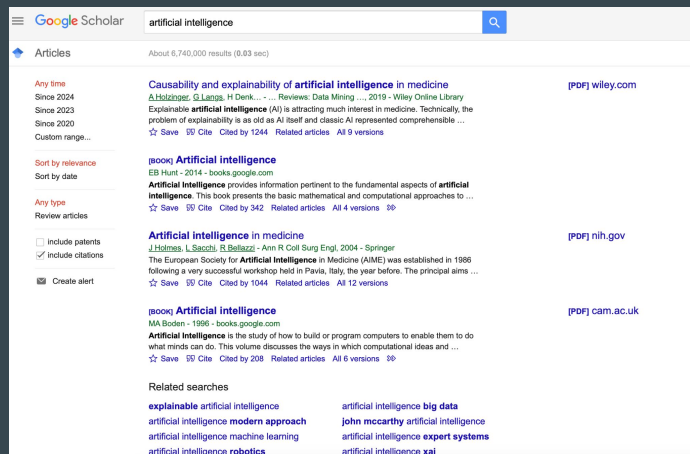
Emily DJ

Patches



Idea Generation

- Inspired by 2024 OMSCS Conference
- Hot Topic: Continued learning (PhD? Research lab?) or specialized learning space
 - Where to start?
 - Google Scholar - a great start, but overwhelming
 - Google Scholar Enforces its own sorting algorithm
 - How do we find top researchers?
- Initial Thoughts:
 - Can we simplify Google Scholar searches?
 - Could we find leading researchers?
 - Summarize their research?
 - Use Google Patents API to find top innovators?
 - Use Linkedin to follow top researchers and innovators?
 - So many thoughts...



Elevator Pitch

“For students (current or future), there is no easy way to explore the various labs and researchers that might align with their interests. This leaves students, especially remote learners, bewildered and overwhelmed with all the information available online. We built an app that allows students to search for a research topic of interest to them, and returns a list of top researchers along with specializations, recent paper titles and a summary of their most recent research.” - Emily & Anubha

“Finding the right research opportunities as a student, especially in a remote learning environment, can be daunting. That's why we've developed an innovative solution. Our app simplifies the process by providing students with an easy way to explore various labs and researchers aligned with their interests. With just a few clicks, students can search for a research topic and receive a curated list of top researchers, complete with their specializations, recent paper titles, and summaries of their latest research. Our platform streamlines the search process, empowering students to discover exciting opportunities tailored to their academic pursuits.” - ChatGPT

Planning Process

What

Find movers and shakers of specialties
Given a research area, our model will find top contributors, and summarize (with GPT) their research on that topic based on Google Scholar.

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For Who

For Students
(Current or Future)

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Why

Find top researchers and follow them

PhD

- Where to start
- What Labs
-

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Our Connection to the topic:

- Inspired by OMSCS Conference
- PhD aspirations some day, hard to know where to start in some domains

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How

Streamlet App

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Python Backend with API Library

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GPT

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Google Scholar API
Author Profiles

GPT to Summarize findings.

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Open Questions

Design

- Definition of "Top"
- Top Researchers, or top authors
- What is out anchor,
- Curation

What result are we looking for as a result

- Labs? People? Assignees?

API

- How much control do we have over the search
- Does the query let us sort by citations
- Can we pick "top" assignees by citations for a field
- Define assignees, is there any tuning we would table as next steps
-

Given a topic, what info is given back for A)Authors, B)Assignees

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Stretch

Streamlit to visualize

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Validate Response

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Connect Companies and Organizations

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LinkedIn connection to track history

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Research Lab

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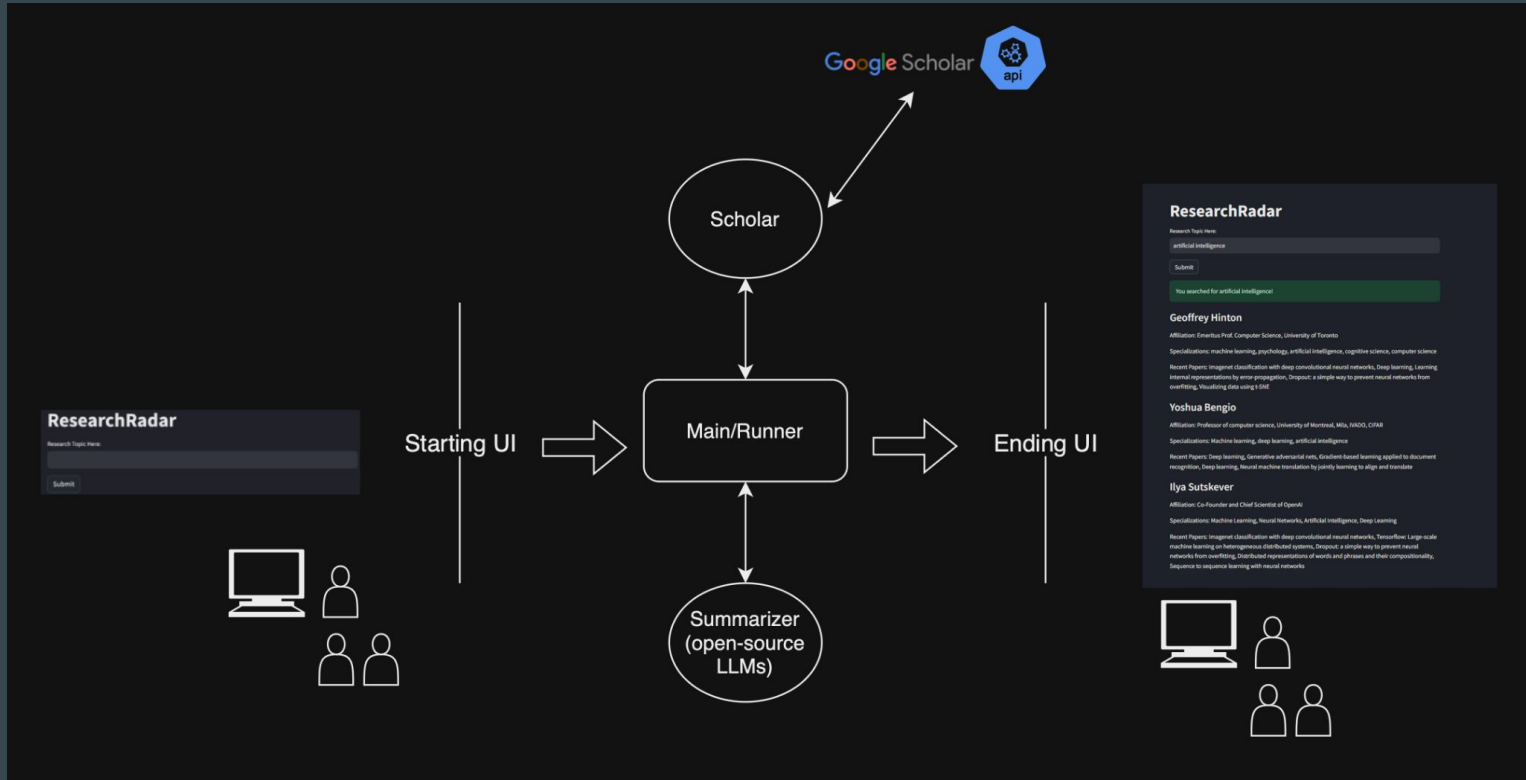
GPT: If it knows current lab based on person describe that as well

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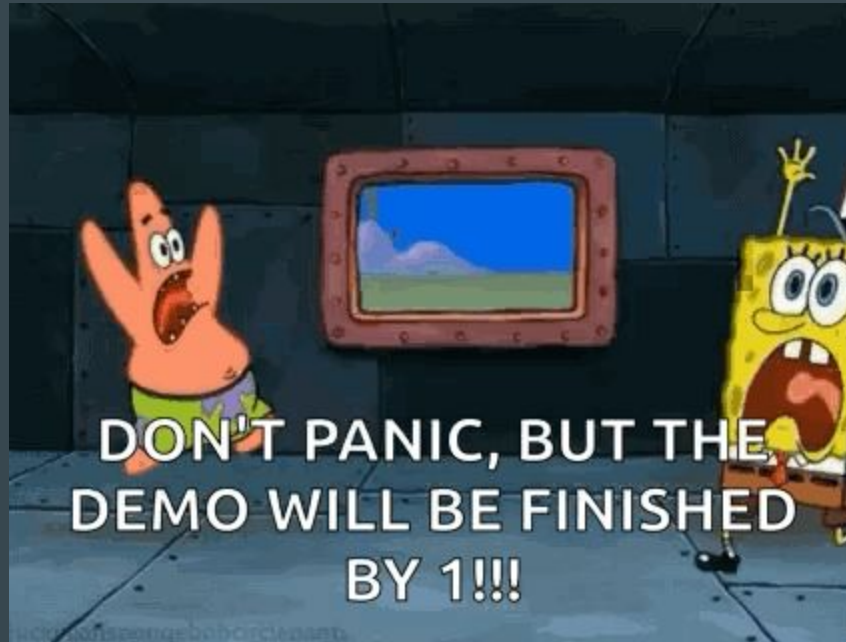
Incorporate Google Patents

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System Design



Live Demo



Ideal State: ChatGPT Integration

ResearchRadar

Research Topic Here:

artificial intelligence

Submit

You searched for artificial intelligence!

Geoffrey Hinton

Affiliation: Emeritus Prof. Computer Science, University of Toronto

Specializations: machine learning, psychology, artificial intelligence, cognitive science, computer science

Recent Papers: Imagenet classification with deep convolutional neural networks, Deep learning, Learning internal representations by error-propagation, Dropout: a simple way to prevent neural networks from overfitting, Visualizing data using t-SNE

Yoshua Bengio

Affiliation: Professor of computer science, University of Montreal, Mila, IVADO, CIFAR

Specializations: Machine learning, deep learning, artificial intelligence

Recent Papers: Deep learning, Generative adversarial nets, Gradient-based learning applied to document recognition, Deep learning, Neural machine translation by jointly learning to align and translate

Ilya Sutskever

Affiliation: Co-Founder and Chief Scientist of OpenAI

Specializations: Machine Learning, Neural Networks, Artificial Intelligence, Deep Learning

Recent Papers: Imagenet classification with deep convolutional neural networks, Tensorflow: Large-scale machine learning on heterogeneous distributed systems, Dropout: a simple way to prevent neural networks from overfitting, Distributed representations of words and phrases and their compositionality, Sequence to sequence learning with neural networks



Simple prompt: 2-3 sentences requested

Geoffrey Hinton's latest research highlights significant advancements in deep learning methodologies. These include improved image classification accuracy with convolutional neural networks, techniques such as dropout to combat overfitting, and the development of t-SNE for advanced data visualization. These contributions underscore the ongoing evolution of machine learning techniques across diverse domains.



Updated prompt: 3-5 sentences requested with specifics

Yoshua Bengio's latest research illuminates specific advancements in deep learning methodologies. His work introduces novel frameworks like adversarial nets for generative modeling, enabling simultaneous training of generative and discriminative models. Additionally, Bengio's exploration of neural machine translation techniques, such as soft-search mechanisms, showcases advancements in improving translation performance without fixed-length vector constraints. These contributions offer tangible progress towards enhancing deep learning models' capabilities across domains like image generation and language translation.

Challenges

ChatGPT Charges for
API Use



ChatGPT

Sub-Par Alternative
Summarization

**Geoffrey Hinton at Emeritus
Prof. Computer Science,
University of Toronto**

Their specializations include: ['machine learning', 'psychology', 'artificial intelligence', 'cognitive science', 'computer science']. We trained a large, deep convolutional neural network to classify the 1.3 million high-resolution images in the LSVRC-2010 ImageNet training set into 1000 different classes . On the test data, we achieved top-1 and top-5 error rates of 39.7% and 18.9% which is considerably better than the previous state-of-the-art results . Deep learning allows computational models that are composed of multiple processing layers to learn representations of data with multiple levels of abstraction .

Google Scholar
API Monthly
Limit



New Skills!



Google Scholar API



Canva



Python



ChatGPT



Prompt Engineering



Open Source LLMs



Streamlit UI