

AI Tools for Data Science Research & Intellectual Property

Enhancing discovery and IP management for PhD students and researchers.

PS by Priti Solanki



Why AI Tools Matter

1 Scale

Process vastly more information than humanly possible.

2 Speed

Accelerate discovery timelines by orders of magnitude.

3 Novel Insights

Identify non-obvious patterns and connections.

4 Competitive Advantage

Essential skills for academic and industry careers.



Data Analysis & Processing Tools

Machine Learning Libraries

TensorFlow/PyTorch for detecting anomalies in large datasets.

Natural Language Processing

BERT/GPT for extracting structured information from unstructured research data.

Literature Review & Knowledge Management



Semantic Scholar

Transition from keyword to concept-based search.



Elicit.org

Formulate research questions and generate summaries across papers.



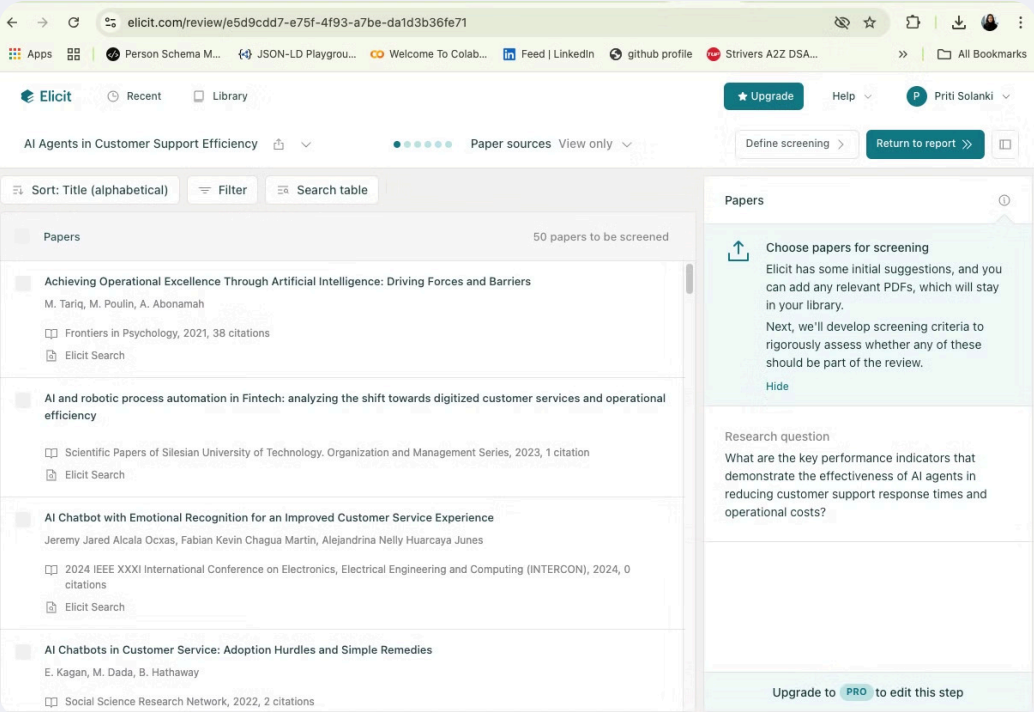
Connected Papers

Map citation networks and identify research gaps.



Demo

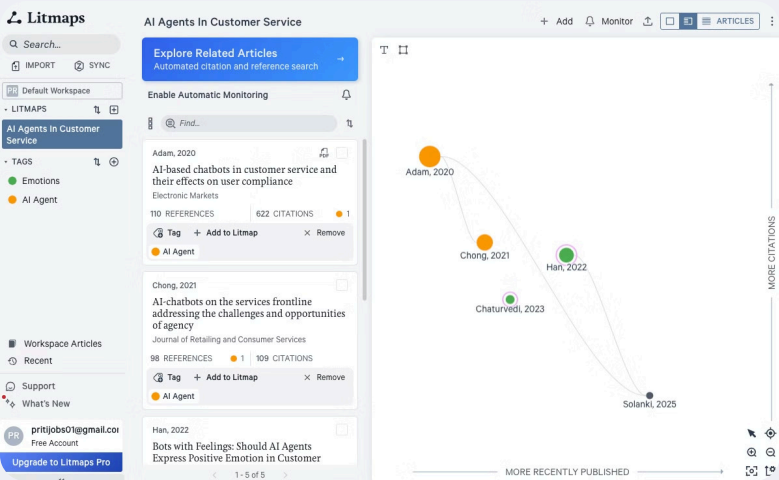
Elicit



elicit.com



Litmaps



Your Literature Review Assistant

Discover literature and accelerate your entire research process with the most powerful visual search tool.

Experiment Design & Optimization

Define Parameters

Set search spaces for optimization.

Analysis

Evaluate results and refine approach.



Bayesian Optimization

Efficiently tune hyperparameters.

Simulation

Model complex phenomena before expensive real-world experiments.



Writing & IP Support

AI Writing Assistants

Generate drafts, refine language, and improve clarity in technical papers.

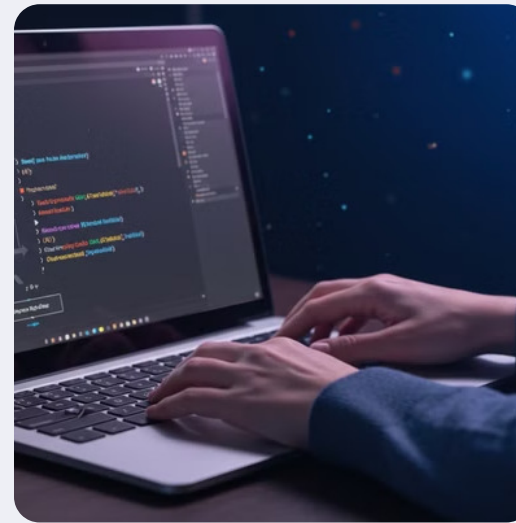
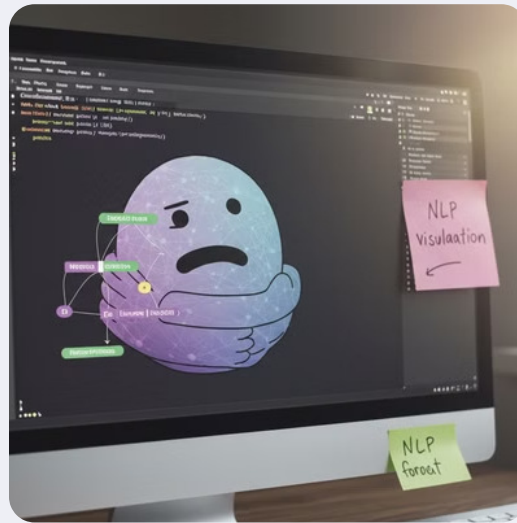
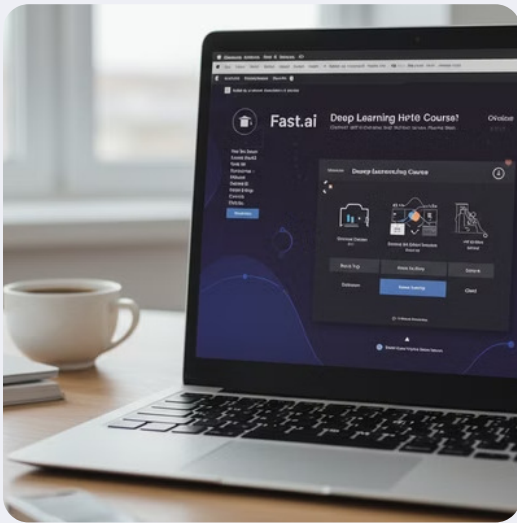
Patent Search & Analysis

Semantic search across patent databases and visualization of patent landscapes.

AI-Generated IP

Generate novel structures with desired properties, with attribution considerations.

Resources for Getting Started



Learning platforms include Fast.ai, Hugging Face Courses, and Papers with Code. Join AI for Science Discord Community for support.