AI-POWERED STUDENT RESEARCH

Dr. Katya Vladimirov

I.

AI APPLICATIONS FOR SOCIAL SCIENCE AND POLITICAL SCIENCE RESEARCH

1. A university team developed a database of 250 Artificial Intelligence applications useful for social science research. To be included in that database, the AI tool had to be useful for:

1) literature reviews, summaries, or writing,

2) data collection, analysis, or visualizations,

3) research dissemination.

In the database, a team provides a name, description, and links to each of the AI tools that were current at the time of publication on September 29, 2023.

This database includes 132 AI tools that may be used for literature reviews or writing, 146 tools that may be used for data collection, analyses, or visualizations, and 108 that may be used for dissemination efforts. While 170 of the AI tools within this database can be used for general research purposes, 18 are specific to social media data analyses, and 62 can be applied to both. The database thus offers some of the recently published tools for exploring the application of AI to social science research.

Another university uses a dataset of nearly 100,000 images from Mercedes dash cams in European cities. They gathered the 3D coordinates of the pedestrians in all these cities, and we can use them to see how different people interact.

Experts at another University are using statistics AI, big data and machine learning to better understand our world. They combined their substantive knowledge in the fields of politics, sociology, and criminology with statistical techniques, Natural Language Processing, spatial and geographical analysis, and many other data science methods to analyze large, unstructured, and “noisy” data. This gives them novel insights into a wide range of social problems and phenomena, including online extremism, disinformation, educational attainment, political communications, voting behaviors, and climate issues.

II.

Testing AI’s genuine nature

Generative AI tools are being used to automate the creation of fake news stories and spread disinformation on everything from elections and current events to health care and entertainment. As these stories become easier to create and more authentic in their style, they become more difficult to differentiate from genuine news stories. Identifying how fake news is created and spread can help to mitigate its harm and support efforts for more ethical applications of AI.

A wave of touching photos capturing great moments in time fascinates amateur historians online. The problem? They are not real and may be clouding our view of the past.

Widely shared on social media, the atmospheric black-and-white shots—a mother and her child starving during the Great Depression, an exhausted soldier in the Vietnam War—may initially appear to be authentic historical documents. But they were created by artificial intelligence, and researchers fear they are muddying the waters of real history.

One photo shared on Facebook shows a pair of fresh-faced young men posing in front of an antique biplane: purportedly Orville and Wilbur Wright at the time of their first powered flight. However, those are not the Wright Brothers. Real archive shots from the period depict mustachioed Orville and his taller brother Wilbur in flat caps, looking nothing like the blond pair in the sepia-hued AI image.

Among the images created using Midjourney, a popular AI online image generator, is a series of fictitious reproductions depicting the moment when the suspected assassin of President John F. Kennedy, Lee Harvey Oswald, was shot dead by Jack Ruby in 1963.

Other images on Midjourney purport to show the explosion of the atom bomb over Hiroshima in 1945, the invasion of Prague by Soviet-allied troops in 1968, and even a vision of the Roman Coliseum in ancient times.

This creates a risk of false visuals being accepted as fact, which could, over time, distort students’ understanding of history and weaken public trust in visual evidence as a reliable source for learning about the past.

One university professor allowed English composition students to use generative AI platforms throughout the course and found mixed results. When brainstorming topic ideas, identifying keywords or summarizing verified documents, AI was helpful. But when looking for a literature review with the best 10 sources, the chatbot generated false references, called an AI hallucination. These hallucinations taught students a valuable lesson in verification.

One suggested solution to make students active participants:

Penn State's Center for Socially Responsible Artificial Intelligence (CSRAI) hosted "Fake-a-thon," a five-day competition to better understand the role of generative AI in the creation and detection of fake news. The event is open to all members of the University community with a valid Penn State email address.

The Fake-a-thon consisted of two stages:

Participants use generative AI tools like Chat-GPT or Microsoft Copilot to create and submit fake news stories about any topic.

Participants are invited to scrutinize entries, which will be mixed in with genuine news stories from event organizers, to determine if submitted stories are fake or real.

First ($500), second ($300), and third place ($200) prizes are awarded to the fake stories that were most effective in fooling participants in the second stage into believing they are real. In the second stage of the competition, four individuals who accurately identify the highest percentage of fake news stories each receive $50. All participants are asked to participate in a post-event survey for an ongoing research project and to provide feedback or use their news story for research purposes.

FINALLY, A LIST OF THE BEST AI FOR SOCIAL SCIENCES AND HUMANITIES RESEARCH

Consensus:

Helps researchers find research-backed answers quickly by extracting content from peer-reviewed papers.

Scite: Provides "Smart Citations" that indicate how many studies support or oppose claims in a given paper, aiding in literature review.

ResearchRabbit:

A citation-based tool that transforms how researchers discover relevant papers and track emerging studies.

QuillBot:

While not a traditional research tool, it can be used for paraphrasing and simplifying complex content, helping researchers understand and rephrase information.

Data Analysis and Visualization:

SPSS:

A widely used statistical software package for data analysis and visualization, particularly in social sciences.

- **NVivo:**

A qualitative data analysis software that is effective for analyzing interview transcripts and text-based data.

- **Tableau and Power BI:**

Data visualization tools that help researchers visualize complex datasets and identify trends.

- **D3.js:**

A JavaScript library for creating dynamic and interactive data visualizations.

- **Gephi and UCINET:**

Software used for social network analysis, visualizing networks and studying relationships within them.

Writing and Editing Assistance:

QuillBot: Can help with paraphrasing, grammar checking, and summarizing text.

- **Paperpal:** An AI-driven tool designed to assist with academic writing, improving clarity and precision.