Project title

Promoting AI Literacy through Interactive Visualisations

Contact
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Research project
Artificial Intelligence (AI) is progressively reshaping numerous facets of human life, ranging from conversational technologies to autonomous systems. However, understanding its principles and implications often requires technical expertise, creating a divide between AI practitioners and the wider public. This lack of AI literacy can lead to misconceptions, mistrust, and limited informed participation in effectively using, collaborating with, and critically evaluating AI.

Emerging research has investigated various strategies for cultivating AI literacy among individuals without technical expertise. Interactive visualisations stand out as a promising approach to making AI concepts approachable, understandable, and easy to grasp for diverse audiences. By incorporating data-driven storytelling (e.g., just-in-time explanations [2] and explanatory animations [3]), these tools can bridge knowledge gaps and empower non-technical audiences to critically engage with AI systems.

This project aims to **foster AI literacy among non-technical audiences through the design and development of interactive visualisations**. The objectives are:

1. To identify key AI concepts and applications essential for public understanding, such as privacy risks in conversational AI, bias in algorithms and data.
2. To create accessible and interactive visualisation tools that integrate storytelling elements to foster a deeper, data-driven understanding of AI concepts.
3. To establish a platform that deploys these tools for diverse applications within the educational context.
4. To evaluate the effectiveness of these visualisations in improving AI literacy, collecting feedback from non-technical audiences.

The project responds to the growing need to promote public understanding of AI. Firstly, it will contribute valuable **insights into public perceptions of various AI concepts** and systems, along with their expectations for AI education. Secondly, **the proposed platform featuring various data visualizations and interactive techniques**, will serve as an educational resource for AI literacy. Thirdly, this project will provide a comprehensive summary of evaluation results and user feedback, thereby contributing **a set of design guidelines and insights**, informing the design of future educational tools in AI and other emerging technologies.

The project's interdisciplinary approach, combining AI, Data Visualisation, Human-Computer Interaction, and Education, provides a broad impact. It can be integrated into community outreach programs and schools, enhancing STEM education. Publications are aimed at top-tier international conferences (CHI, VIS, EuroVis, IUI) and journals (TVCG).

Project Timeline

Year 1: Identify key AI concepts and public perceptions.

- Review related publications and educational resources for teaching AI concepts and systems, along with the expert consultation.
- Define targeted audiences, and conduct interviews to gather insights on their perceptions and learning needs.

Year 2: Design and develop interactive visualisations and interfaces.

- Design and develop initial prototypes of interactive visualisations and storytelling elements to explain the identified AI concepts.
- Organize small user focus groups to assess prototype effectiveness.

Year 3: Deploy the platform and collect initial feedback.

- Build an online platform for deploying the developed visualisations.
- Test the platform in the educational application through case studies, workshops, and user studies, to collect initial feedback and refine it.

Year 4: Conduct the evaluation and write up the thesis.

- Conduct longitudinal evaluations to obtain richer feedback on how these visualisations and storytelling techniques promote AI literacy.
- Summarize outcomes and design guidelines, and write up the thesis.

Supervision Environment

- Basics: A supportive and collaborative research environment, access to ample computing resources, rich collaboration opportunities at home and abroad, and multidimensional training from collaborators.
- **Personalised training**: Regular one-on-one meetings and hands-on training particularly on junior students will ensure tailored guidance, foster essential skill development, and create pathways for future opportunities. Advanced training in mentorship and leadership skills for senior students will further support their growth into independent and capable researchers.

Applicant skills/background

The applicant should demonstrate skills in developing user interfaces (e.g., JavaScript, front-end frameworks like Vue/React) and visualizations (e.g., to know d3.js). Prior experiences with relevant AI tools (e.g., openAI APIs) is considered as a bonus. Knowledge in data visualization, experimental design, and statistical analysis would further strengthen the candidate's profile.

References

[1] Long, Duri, and Brian Magerko. "What is AI literacy? Competencies and design considerations". In *Proceedings of the 2020 CHI conference on human factors in computing systems*. 2020.

[2] Shu, Xinhuan, Alexis Pister, Junxiu Tang, Fanny Chevalier, and Benjamin Bach. "Does This Have a Particular Meaning? Interactive Pattern Explanation for Network Visualizations". *IEEE Transactions on Visualization and Computer Graphics*. 2024.

[3] Xinhuan Shu, Aoyu Wu, Junxiu Tang, Benjamin Bach, Yingcai Wu, and Huamin Qu. "What makes a data-GIF understandable?." *IEEE Transactions on Visualization and Computer Graphics*. 2020.