

I am a first-year PhD student in Computer Science at the University of California, San Diego with a strong interest in securing a summer internship at the Max Planck Institutes, as part of my ongoing academic journey. My academic pursuits have ignited a passion for researching the intersection of human-computer interaction (HCI), security, privacy, and social computing. With a diverse skill set encompassing large-scale data-driven analysis, user-centered studies, and empirical research methodologies shaped by a deep fascination with the challenges posed by sociotechnical systems in our increasingly digital world. I am particularly drawn to understanding how digital safety threats are operationalized in the face of rapidly evolving technologies and policies and exploring user-centered perspectives to design interventions that empower individuals to navigate these technologies securely and trustworthily. My research endeavors are guided by a keen interest in privacy policy-related challenges in HCI and the principles of privacy by design, with a focus on contextual integrity. In the realm of cybersecurity, I am committed to conducting empirical analyses across various stakeholder groups to identify and address emerging challenges

My academic foundation is rooted in both Economics and Computer Science, providing me with a unique interdisciplinary perspective. My undergraduate studies in Economics equipped me with a strong grounding in causal inference methods, the economics of fairness, and algorithmic bias, using social choice theory and social welfare approaches. This grounding has been invaluable in my ability to translate complex theoretical concepts into practical applications, particularly within the domain of large-scale data-driven algorithmic systems.

During my tenure as a **Research Fellow** at **Microsoft Research, India**, I had the privilege of being advised by Prof. Joyojeet Pal from the University of Michigan. This experience allowed me to work on problem statements at the intersection of Social Computing, HCI, and Data Science. I engaged in quantitative methods such as causal inference and information extraction, as well as qualitative methods, including interviews and surveys.

One of my primary research interests centers around sociotechnical systems, particularly those prevalent in social media and online news media. These platforms are plagued by issues such as polarization, propaganda, and misinformation, with recommendation systems often contributing to the formation of echo chambers and filter bubbles. My aim is to understand and evaluate these sociotechnical systems from the perspective of contestability, thereby countering problematic information dissemination online. I am intrigued by the question of how recommender systems can align with the values of individuals and societies, and how news recommender systems can be designed to promote trustworthiness and engagement within communities and organizations. Additionally, I have been actively involved in projects aimed at building tools to aid fact-checkers, journalists, and content moderators, enhancing their processes and contributing to the overall trustworthiness of information systems.

My approach to research is characterized by a holistic involvement, starting from the meticulous curation of datasets—often involving the collection and annotation of data through crowdsourcing or domain expert workshops. I am acutely aware of the ethical and reliability challenges associated with data collection, particularly when studying marginalized and underrepresented communities. My experience compiling the DISMISS database, which cataloged over 11,000 influential accounts on Indian Twitter, is a testament to my commitment to rigorous and ethical data practices. This work, described in detail in [1], was accepted at ICWSM 2022 and serves as a foundation for several subsequent projects. Another significant contribution is my research into the socio-political messaging of defense personnel in the Indian context, accepted at ICTD 2022 [8]. This work explores how defense personnel engage with sociotechnical systems and the implications of their messaging in the broader information ecosystem.

My exploration of propaganda networks led to a deeper understanding of cyclical patterns in problematic information online, particularly during key events such as elections, communal events, and health crises. I have actively sought to comprehend the challenges faced by stakeholders in the information ecosystem, especially fact-checkers. In a project involving the annotation of fact-checked articles with thematic categories and events, I utilized information extraction methods like Question Answering to uncover patterns of misinformation during critical events. The preliminary results of this research have been published as a poster in ACM COMPASS 2022 [4]. Further, through in-depth interviews with fact-checkers and a large-scale analysis of fact-checked articles and their dissemination on social media, I have gained valuable insights into the challenges faced by those combatting misinformation [6].

I am increasingly drawn to the fields of usable security and privacy within HCI. I recognize the importance of studying the safety of sociotechnical systems, especially in the context of cybersecurity. Usability and security must coexist seamlessly to ensure that technology empowers users rather than hinders them. I am eager to explore how user-centered design can play a pivotal role in addressing these challenges and creating a safer digital environment.

I am particularly interested in working with **Prof. Asia Baga** and Prof. **Yixin Zou at MPI**, given their expertise in policy-related operationalizations in online systems. Their recent work aligns well with my research interests, and I believe that collaborating with them would offer a valuable opportunity to contribute to cutting-edge research.

In conclusion, I am excited about the prospect of interning at the Max Planck Institutes during the upcoming summer. I believe that my interdisciplinary background, research skills, and dedication to addressing the challenges of sociotechnical systems align perfectly with the institute's mission. I look forward to the opportunity to immerse myself in a dynamic and collaborative research environment, learn from distinguished researchers, and contribute to innovative solutions that have real-world impact.

Thank you for considering my application. I have attached my curriculum vitae, transcripts, and letters of recommendation for your review. I am enthusiastic about the possibility of discussing my candidacy further and the chance to contribute to the pioneering research conducted at Max Planck Institutes.

#### References:

- [1] **A. Arya\***, S.De\*, D.Mishra\*, G.Shekhawat\*, et.al. DISMISS : Database of Indian Social Media Influencers on Twitter.(ICWSM '22)[[PDF](#)][[Dataset](#)]
- [2] **A.Arya\***, S.R.Shohra\*, J.Pal. Beyond Business: A Poster Contrasting CEO Activism on Social Media in India and the United States.(ACM COMPASS '21)[[PDF](#)]
- [3] D.Mishra, S.Z Akbar, **A. Arya**, S.Dash, et.al. Rihanna versus Bollywood: Twitter Influencers and the Indian Farmers' Protest.(Preprint)[[PDF](#)]
- [4] **A.Arya**, S.Dash, S.Z Akbar, et.al. Leveraging Question Answering to Understand Context Specific Patterns in Fact Checked Articles in the Global South(ACM COMPASS '22)[[PDF](#)]
- [5] **A.Arya**, S.Srinath, J.Pal, M.Jain, A.Sen. Vivaran : A News Aggregation Framework for Organization Level News Consumption(Under Review, CHI Case Study)[[PDF](#)]
- [6] **A.Arya**, S.De, S.Z Akbar, S.Dash, J.Pal. Catch, Corroborate and Communicate: The Contours of Professional fact-checking in India(Under Review, CSCW)[[PDF](#)]
- [7] S.Dash, **A.Arya**, S.Kaur, J.Pal. Narrative Building in Propaganda Networks on Indian Twitter.(ACM Web Science '22)[[PDF](#)]

[8] A.Seth\*, S.De\*, **A.Arya**, S.Wilkinson, et.al. Closed Ranks: The Discursive Value of Military Support for Indian Politicians on Social Media(ACM ICTD '22)[[PDE](#)]