

1. Cover Sheet.

Critical Data Studies

Participating Departments:

- Communication Studies
- Criminology
- Global Studies
- Philosophy
- Political Science and Public Administration
- Public Policy PhD Program
- School of Data Science

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Target Category: Areas of Future Opportunity and Investment

Keywords: Critical Studies, Data Science, Surveillance, Discrimination, Quantification

2. Executive Summary: Critical Data Studies

Western modernity has often been characterized as driven by quantification - the tendency to only value what can be represented numerically - and by the effort to treat all problems as amenable to technological solutions. The computational era and more recent emphasis on data-driven insights and algorithm-powered AI advance and amplify this lineage. At its best, data science offers substantial benefits to fields such as healthcare, marketing, criminal justice, education, public policy and various academic disciplines; however, these benefits need to be studied alongside the risks of real social and political costs.

With increasing public concern for the protection of vulnerable individuals in a data-driven economy, Big Data studies are experiencing a “critical” turn. Critiques of value-free, instrumental thinking about data have gathered momentum in a variety of disciplines (Iliadis & Russo, 2016). Those engaged in this critique include philosophers challenging knowledge production centered on quantification and techno-solutionism (Frischmann & Selinger, 2018; Kitchin, 2014; Shove, Pantzar, & Watson, 2012); political economists revealing the hazards and harms of surveillance capitalism (Zuboff, 2019); legal scholars studying the restructuring of the regulatory system to support the ends of data capitalism (Cohen, 2019; Hull, 2021); post-colonial scholars questioning forms of data colonialism (Couldry & Mejias, 2018); critical race theorists exposing the reinforcement of racism through algorithmic arrangements (Noble, 2018) and technological bias (Benjamin, 2019); feminists championing data feminism to counter gender-based discrimination (D'Ignazio & Klein, 2020); and historians probing the genealogy of the informational person (Koopman, 2019) and Black software (McIlwain, 2019). In short, Critical Data Studies engage with data as a form of power, going beyond technical solutions and incorporating research from the social sciences and humanities on unequal social structures (Crawford et al., 2019). For example, privacy questions are recast as problems of power and social classification rather than consumer choice (Hull, 2015). Data-based policing is contextualized as a discriminatory practice (Browne, 2015; Muhammad, 2019; Selbst, 2017). China's latest experiment with the Social Credit System and Alibaba's Sesame Credit are assessed as serious governmental and commercial attempts at quantified personhood (Jiang, 2020). Finally, data colonialism raises questions of global data inequality that are fueling demands for data localization and ownership beyond national security concerns (Arora, 2019).

Viewed as a totality, Critical Data Studies work represents the necessity of interdisciplinary and international collaborations. We have put together a diverse team of researchers that will map the ever-changing, complex terrain of contemporary big data practices and offer solutions that require not only technical expertise but also attention to modalities of law, politics, economics, culture, race, gender, and class. Our work is also inherently comparative and global, spanning local arrangements, global interconnections, and legacies of colonialism in the Global South. Such a scope is beyond the abilities of one singular scholar or neatly-siloed discipline. It is in this way that our Critical Data Studies team represents an important avenue of collaboration and transformation for the university and our region as a data (studies) hub. Moreover, careers in data analysis, innovation, and analytics offer lucrative employment opportunities for our students. Our role, then, is not only to train students with employable skills, but to ensure we produce graduates capable of traversing the practical and ethical terrains of Big Data, thereby contributing in significant ways to our university's mission as a higher learning institution: the production of high-level graduates who are both well-equipped for the job market and who are critical thinkers and positive members of society.

3. Evidence of Strength and Excellence: Critical Data Studies

Critical Data Studies is an emerging research area in which UNC Charlotte is poised to be a national leader. The need to confront ethical and political problems associated with data is recognized by both leading institutions in the U.S., such as Princeton, Purdue, and New York University, and internationally, such as the Machine Intelligence Institute of Africa, the African Academy of Sciences, the University of Amsterdam, and the Alan Turing Institute. The faculty group here is well-positioned to join these ranks and elevate UNC Charlotte to a national leader in this area.

Group members have already achieved impact and success in both publication and funding in Critical Data Studies. Gordon **Hull** (2015) has been cited over 100 times across a range of disciplines. Min **Jiang** is an internationally recognized expert of Chinese Internet Studies who is currently co-editing a book on cyber/data policies in BRICS countries and contributing to an international project on global media concentration across 40 countries. Justin **Grandinetti's** work has been published in impactful media studies journals including *Information, Communication, and Society*, *Critical Studies in Media Communication*, and *Surveillance and Society*. Bruce **Arrigo** has several recent papers and a forthcoming edited volume on datafication and crime (Arrigo & Sellars, in press; Browning & Arrigo, 2020; Arrigo, Sellars & Sostakas, 2020; Sellars & Arrigo, 2018). Yaoyao **Dai** uses data analytics to study how authoritarian governments manipulate public opinion. The group also has an extensive publication record in critical studies and theories more broadly: Joyce **Dalsheim** (2014, 2019), Andrea **Pitts** (2021) and **Hull** (2020) all have recent, single-author monographs using critical theory in other areas. Our reach is not just academic; Doug **Hague** (2019, 2020a, 2020b, 2020c, 2020d, 2020e) has given a growing number of papers and presentations to industry leaders.

Group members have also achieved significant success in external funding. Recent relevant funded research and requested funding by group members includes:

- Windett, J. (lead-PI), Cho, I. (PI), **Hull, G.** (PI), Shaikh, S. (PI), Moller, S. (PI), “Building the Federalism Data and Advanced Statistics Hub (F-DASH),” NSF award #1937033 [\$1 million]
- **Brown, C.** (Co-PI), “The Charlotte Data Science Corps - Data Acumen through Charlotte Urban Research and Education (DA CURE),” National Science Foundation (NSF), Harnessing the Data Revolution (HDR): Data Science Corps (DSC), Collaborative Research: HDR DSC. [Funds requested: \$1 million]
- **Brown, C.** (Senior Personnel), National Science Foundation (NSF), AI Institute: "AI for All" Institute: Bringing diversity in AI workforce readiness, research, and outreach [\$20 million]
- **Jiang, M.** “Global Media Concentration Project” (2021-2027). China team lead and advisory board member on a 40-country grant, led by Dr. Dwayne Winseck (Carlton University, Canada) and Dr. Eli Noam (Columbia University, U.S.). Social Sciences and Humanities Research Council of Canada [Final review. Funds requested: \$2.5 million]
- Maher, M. (lead-PI), Ghasemi, A. (PI), Mickelson, R. (PI), Zhang, D. (PI), **Hull, G.** (PI), Dou, W. (PI), Lee, M. (PI) and Rooshenas, A. (PI), “Trustworthy Human-AI Interdisciplinary Consortium (THInC),” NSF program (for graduate education) [Funds requested: \$3 million]

The group’s most significant curricular contribution has been the integration of Critical Data Studies in the development of a team-taught, studio course (DTSC 1301) in the

undergraduate Data Science major. The course is an introduction to data acquisition, modeling, and analytics for interpreting data and developing hypotheses in the context of Critical Data Studies. Students learn to use statistical methods/tools and programming languages to explore social problems as well as the ethical and political implications of collecting and using data across a variety of domains, including the health sciences, public policy, and education. The inaugural version of this series courses was taught in Fall 2020, with group member **Pitts** as one of the faculty. Moreover, the integration of Critical Data Studies throughout the Bachelor of Science in Data Science curriculum was presented in Fall of 2020 in the Academic Data Science Alliance conference and is being monitored by many top data science programs at other universities. Our approach is unique in undergraduate data science and places UNC Charlotte at the forefront of integrating Critical Data Studies research into an interdisciplinary curriculum.

The pioneering series of studio courses are also the model for similar graduate curricular innovation in a \$3 million NSF grant proposal (to be submitted in Feb. 2021) where group member **Hull** is a PI. In addition, the “Trustworthy AI” grant proposal will require participating doctoral students to devote dissertation work to focus on: robust AI, human-centric AI, and ethical AI. Further, a Certificate program is proposed to allow graduate students outside School of Data Science (SDS) to participate in studio courses and supporting coursework, an approach garnering letters of support from three large financial institutions **Hague** works with.

The efforts of Critical Data Studies extend to programs relevant to the Charlotte community. For example, the group has worked collaboratively to bring discussion of Critical Data Studies issues to both UNC Charlotte and the Charlotte community by sponsoring leading scholars of the field, such as Ruha Benjamin and Safiya Noble, to present to both the university community and the community of regional practitioners at venues such as the annual Analytics Frontiers and Women in Data Science (WiDS) conferences. In addition, group member **Hague** is highly engaged with industry practitioners and has contributed to a recent book on ethics in the data science industry. He also leads a group of model risk executives from eight of the largest 15 banks in the U.S. that are a key part of the understanding and managing the implications of bias and fairness of data science in these banks.

These converging priorities indicate that Critical Data Studies should be central to UNC Charlotte’s emergence as an R1 institution. Our group is well poised to contribute to that emergence, but further investment (additional faculty lines, reduction of teaching loads, post-doctoral fellowships) would significantly enhance our institution’s capacity to go after and secure large-scale grants on projects related to data, algorithms and AI. As the NSF deepens its commitment to ethics, transparency, accountability, fairness, and diversification, it will be increasingly important to have additional faculty who can contribute to such endeavors. Further, investment in Critical Data Studies overlaps with our existing proposal for an interdisciplinary Ph.D. program in Digital Cultures & Communication initiated by CLAS and CCI. Similarly, as SDS grows, the need for instructors who can teach studio courses at all levels will grow, and that need is currently difficult to meet because teaching in SDS trades off with the ability of faculty to contribute to their home departments. Finally, additional resources would enable the group to pursue a more influential status in the region and nationally by pursuing a Center for Data Ethics; such a Center would have the potential to transform instructional and business practices and culture in this area (e.g. by issuing certificates to students and business professionals).

4. Alignment with Regional and National Priorities: Critical Data Studies

The work of the Critical Data Studies group aligns with recognized regional, national and international priorities. This is reflected in agency funding priorities, national and international governance priorities, businesses central to Charlotte as a regional technology and data hub, and values central to UNC Charlotte as an institution.

The National Science Foundation (NSF) has designated “Harnessing the Data Revolution” as one of the ten big ideas to receive priority in funding, and the agency has emphasized the importance of ethics in proposals. Proposals must also address diversity, equity, and inclusion issues; one clear way to support the increased representation of minorities in STEM disciplines is to understand ethics in a way that is responsive to structural issues of race and discrimination. This focus helps to frame proposals in a way that grounds the research in ethical understanding and supports the ability to critically evaluate the implications and diverse viewpoints. The Association of Computing Machinery (ACM) also formed a working group to create global ethical guidelines for computing education (Hughes, et al, 2020).

There has also been an explosion of national and international rulemaking around responsible data management, most prominently in the APEC Privacy Framework (2015), EU’s General Data Protection Regulation (GDPR) (2018), and state-level laws such as the California Consumer Privacy Act (CCPA) (2018). Proposed legislation includes the federal Algorithmic Accountability Act and New York City Council’s Local Law 49 on algorithmic bias and discrimination. Recent legislation is also being used to target specific uses of data, most prominently the federal Genetic Information Nondiscrimination Act (GINA) and Illinois’ Biometric Information Privacy Act (BIPA, originally passed in 2008 and recently successfully applied against Facebook’s Phototagging feature). There is also international concern with specific applications of data, such as the EU’s recent High Level Expert Group on Artificial Intelligence (2019) report and its promulgation of ethical guidelines for trustworthy AI. At the same time, there is a growing recognition that data protection and privacy intersect with Fourteenth Amendment disparate impact concerns (Hu, 2017), bureaucratic blacklisting by government agencies (Hu, 2015), and fairness in social systems (Selbst et al., 2019).

Critical Data Studies also addresses central concerns of the Charlotte region. Charlotte is the second largest financial center in the country, in which banks are striving to achieve fairness, equity, trustworthiness, and explainability while embracing data analytics. As a result, there is a high demand for data professionals who have a comprehensive understanding of data not only from a technical perspective, but also from social and ethical perspectives. Hague’s working group on model risk management has focused nearly 50% of their time and efforts in this area. More generally, the World Economic Forum’s 2020 *Future of Work* report’s top three job roles across industries are Data Analysts and Scientists, AI and Machine Learning Specialists, and Big Data Specialists (World Economic Forum, 2020, p. 30).

Finally, Critical Data Studies centers the experiences of marginalized communities and individuals, and works to address structural issues of bias and discrimination in data. In so doing it reflects and honors UNC Charlotte’s commitment to inclusion and equity while simultaneously supporting institutional workforce preparation goals.

5. Supporting Documents: Critical Data Studies

Contributor	Title/Appointment	Expertise
Bruce Arrigo	Professor of Criminology, Law and Society; Dept. of Criminal Justice	Criminology; privacy and surveillance; carceral policy
Cheryl Brown	Associate Professor and Chair, Political Science and Public Administration; Affiliated Faculty in School of Data Science, Social Aspects of Health Initiative (CLAS), and CyberDNA Center (CCI)	Data privacy and trust; technology and culture, global privacy regulations and ethical responsibility, health data privacy and ethics in autonomous and intelligent systems, algorithmic and implicit bias in healthcare and education
Joyce Dalsheim	Associate Professor, Global Studies	Cultural Anthropology, critical theory, conflict, modernity, temporality, nationalism, settler-colonialism, racism/antisemitism/fascism
Yaoyao Dai	Assistant Professor, Political Science and Public Administration	Machine learning for social science, information manipulation, populism
Justin Grandinetti	Assistant Professor, Communication Studies	Critical media studies, mobile media, streaming, big data, AI, spatial materialism
Gordon Hull	Professor of Philosophy and Public Policy; Director Center for Professional and Applied Ethics	Moral and Political Philosophy, Philosophy of Technology, Privacy, Intellectual Property
Min Jiang	Professor of Communication Studies	Critical and comparative studies of technology and data; algorithmic bias; Internet governance and regulation (esp. Global South)
Andrea Pitts	Assistant Professor of Philosophy	philosophy of race, critical prison studies, feminist epistemology and science studies, transgender studies
Doug Hague	Executive Director; Professor of Practice School of Data Science	Management of analytics and modeling inside of large corporations. Policies and procedures in managing the ethical implications of models in these corporations.

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