

IFLA DHDS SIG Open Webinar: “Navigating the Risks to Global Inclusiveness: ML/AL Applications in Librarianship and DH/DS Practices.”



Project MOCA: Addressing Bias in Conversational AI



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Learning Objectives

- How Conversational AI agents can be leveraged as a communication tool for library communities
- How Conversational AI or any other AI technique can perpetuate or amplify bias
- The importance of design as a tool for mitigating bias
- How to ethically build an AI tool (Conversational Agent)

The Problem

- Covid COVID-19 pandemic
- Questions from Virtual Reference Chat Data, Students during in-person orientation
- Shortage of staff and budget cuts
- Chatbot or Conversational AI?

AI Bias

- Algorithmic Bias
 - Bias introduced by the design or structure of the algorithms (human developers – explicit, implicit)
- Data Bias
 - Homogenous data set – lack of significant differences within the dataset
- Conversational Bias – learn bias through interactions with the user

Explicit Bias

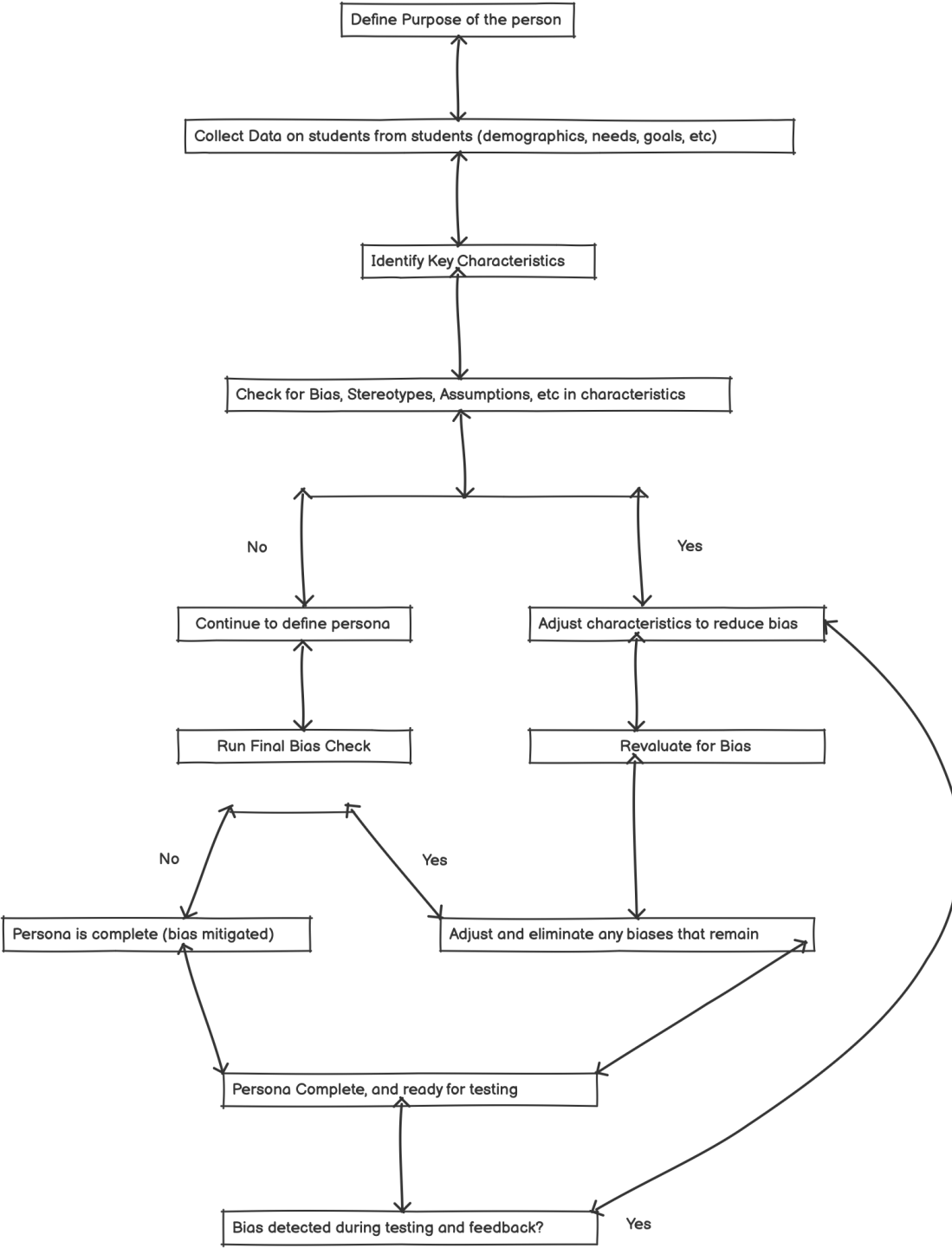
- Aware of our thoughts, emotions, attitudes, stereotypes, and beliefs of a specific group on a conscious level
 - Gender (intentional or unintentional)
 - Accessibility (intentional or unintentional)
 - Religious (intentional or unintentional)
 - Location
 - Academic programs or majors
 - Age

Implicit Bias

- Not consciously aware of our thoughts, emotions, attitudes, and beliefs of a specific group
 - Cultural
 - Racial and Ethnic
 - Socioeconomic
 - Language

Determine Bias

- Create an initial student persona absent data used to infer student persona
- Reflect and recreate



Mitigation Process

Identify Stakeholders

(FYE) First-Year Experience students – defined as students who are attending college or are pursuing higher education for the first time.

Transfer students (undergraduate or graduate) – defined as students who are transferring from another institution (At GMU over 80% of the transfer students come from NOVA, a community college in Northern VA).

International students (undergraduate or graduate) – defined as students who are non-citizens of the U.S.

Parents of FYE students.

Mitigation Process



Identify Stakeholders

- New faculty and staff to the university.
- Non-FYE students using the library for the first time are defined as undergraduate students between their sophomore and senior years at GMU.
- Distance Learning Students – Students who usually work in professional careers and take courses virtually.
- Accessibility - defined as students who can't physically come to the library.
- Access – Students who will need access beyond the current virtual chat timeframe (MOCA - 24-7/365).

Campuses

- 3 Campuses in Virginia, Fairfax, Arlington, and Manassas
- Mason Korea
- 40,000 + Students
- The most diverse student body in VA
 - Represents 130 countries and 80 languages
 - Students from all 50 states
 - 40% are students of color
 - 2800 students are transfer students
 - 700 from Northern Virginia Community College

Other Facts

- One in four students, first-generation students
- 10% of GMU students are current or former military or military dependents
- Students with families
- Students with full-time jobs



Designing a Conversational Agent Ethically (Or Any AI Tool)

- Assemble a team of diverse developers and cohorts for testing throughout the process
- Clearly define the purpose and scope
- Design for inclusivity and accessibility
- Mitigate and address Bias
- Design for ethical interaction between user and system
- Test extensively
- Monitor and update regularly
- Accountability and Documentation

Knowledge Base

Knowledge Base –information expert system retrieves that represents. Human experts provide facts about a particular domain or subject area and contain an acquisition module to gather knowledge from external sources

Expert System

ONNYX Expert System - Software using artificial intelligence techniques. Such systems use databases of expert knowledge to offer advice or make decisions

Exception Handling

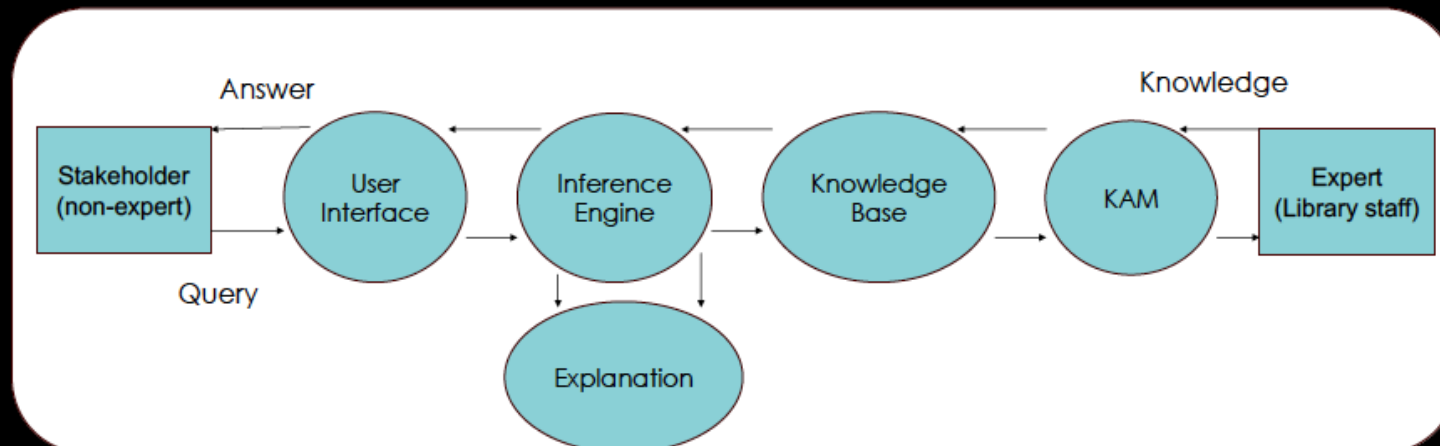
Trolling Algorithm
Trolling Corpus
Previous Chatbot failures

Priori knowledge
Posteriori Knowledge



MOCA Architecture

MOCA Architecture



Ask a Librarian



One-on-One

Have a more detailed, advanced research need?

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Becomes



Default Greeting Prompt: "Welcome to Mason Libraries! My Name is MOCA, Nice to meet you!
"You may type in your question or activate my voice option to begin!"

Query: How many library branches do you have?

Answer: Mason Libraries are comprised of three branch campus libraries. Would you like to know
Where each library is located?



Thank You!
QUESTIONS?



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