Artificial Intelligence Ethical Concerns

Sharon Morris

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Agenda

- AI ethical concerns
- Machine learning in everyday life
- History of AI
- AI Bias
- Initiatives to address AI ethical concerns

AI Ethical
• Lack of transparency
• Bias and discrimination
• Lack of governance and accountability
• Homogenous AI teams
• Democracy and civil rights
## What machine learning can do

<table>
<thead>
<tr>
<th>Input A</th>
<th>Loan Application</th>
<th>Ad Plus User Info</th>
<th>Audio Clip</th>
<th>English Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Picture</strong></td>
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<td><strong>$</strong></td>
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<tr>
<td><strong>Ad</strong></td>
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<tr>
<td><strong>Audio</strong></td>
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<tr>
<td><strong>Sentence</strong></td>
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</tbody>
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### Response B

<table>
<thead>
<tr>
<th>Are There Human Faces? (0 or 1)</th>
<th>Will They Repay the Loan? (0 or 1)</th>
<th>Will User Click on Ad? (0 or 1)</th>
<th>Transcript of Audio Clip</th>
<th>French Sentence</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>Application</th>
<th>Loan Approvals</th>
<th>Targeted Online Ads</th>
<th>Speech Recognition</th>
<th>Language Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo Tagging</td>
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</table>

*Source: Andrew Ng, 2016*
AI beneficial use & capacity for good

- Help people live longer and fulfilling lives
- Transforming almost every profession
- Opportunities for economic development

What is AI?

Artificial Intelligence refers to systems that display intelligent behavior by analyzing their environment and
taking actions – with some degree of autonomy – to achieve specific goals.

Source: Europe Parliament
Artificial Intelligence
Mathematical models for AI introduced
Phrase AI coined

Machine Learning
Computing power improved

Deep Learning
Speech recognition

Engineering of making intelligent Machines and Programs

Ability to learn without being explicitly programed

Learning based on Neural Network

1950's 1960's 1970's
2010's 2012's 2017's
**Why we need data and AI ethics**

<table>
<thead>
<tr>
<th>Data Ethics</th>
<th>AI Ethics</th>
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</thead>
<tbody>
<tr>
<td>• Supports shaping good governance</td>
<td>• Maintains trust between organizations and people</td>
</tr>
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<td>• Legal and privacy compliance</td>
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<tr>
<td>• Manage risks and liabilities</td>
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</tbody>
</table>
What is “Ethics of AI” & “Ethical AI”
### Ethics of AI

<table>
<thead>
<tr>
<th><strong>AI</strong></th>
<th><strong>Human</strong></th>
<th><strong>Society</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of developing AI to interact with other AIs ethically</td>
<td>Principles of developing AI to interact with human ethically</td>
<td>Principles of developing AI to function ethically in society</td>
</tr>
</tbody>
</table>

### Ethical AI

<table>
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<tr>
<th><strong>AI</strong></th>
<th><strong>Human</strong></th>
<th><strong>Society</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>How AI should interact with other AIs ethically?</td>
<td>How AI should interact with humans ethically?</td>
<td>How AI should operate ethically in society?</td>
</tr>
</tbody>
</table>

*Journal of Database Management, April – June 2020*
Dispose
Remove data from servers to prevent future release or use.
Share / Sell
Provide access to datasets or data insights to new sets of data
manipulators or consumers.
Use
Apply the insights gained from data analysis toward making decisions, affecting change.
or delivering a product or service.
Acquire
Ingest data from sensors, systems, or humans, recording its provenance and
consent for use wherever possible.

*Source:* Accenture
Store
Record data to a trusted location that is both secure and easily accessible for
further manipulation.
Aggregate
Combine disparate datasets to create a larger dataset that is
greater than the sum of its parts.
Analyze
Examine and transform data with the purpose of extracting information and
discovering new insights.
Data ethics

Disclose Data
a person, process, or system creates and publishes/shares data

Manipulate Data
a person, process, or system transforms, moves or analyzes data

Consume Data
a person, process, or system benefits from manipulated data
Data

AI
AI Ethics
Starts with Data

- Protection
- Balanced sets
- Stewardship
- Provenance
- Accuracy
- Security

- Human Rights
- Privacy
- Fairness
- Governance
- Transparency
- Accuracy
- Safety
- Legality

- Human Centric
- Bias & Discrimination
- Auditability
- Transparency
- Statistical Accuracy
- Robustness

Source: ARMA
CONFIRM.NYC
MARCH 3, 2021
How does bias happen?

Framing the problem
- What problem will the algorithm solve?
- What is the question to be answered?

Collecting the data
- Are the data representative of reality or does it reflect existing biases?

Preparing the data
- Which attributes should be included in the model?

What is AI bias?
AI bias is an anomaly in the output of machine learning algorithms. These could be due to the prejudiced assumptions made during the algorithm development process or prejudices in the training data.
Types of AI bias

Cognitive bias
Designers unknowingly introducing bias to the model
A training dataset which includes these biases

Statistical bias
Unrepresentative data the
Potential ways to reduce bias

Be aware of established processes and practices to test help correct for bias and those

Establish fact-based conversations for and mitigate bias in AI biases

Engage in fact-based conservations and machines about potential in human

Fully explore humans bias and machines about potential in human

Invest more in research, make more data available for AI field itself

Invest more in diversifying the contexts in which AI can

deflect systems and decisions, respecting high risk for AI to privacy), and exacerbate Bias adopt a

Invest togetherresearch (while
McKinsey

Why AI bias is difficult to fix

- The introduction of bias isn’t always obvious
- Standard modeling practices are not designed to detect bias
- Lack of social context in data collection
Unclear definitions of fairness or lack of fairness
Consequences of biased algorithms
Faulty predictions
Faulty conclusions
Discrimination
Where do we go from here

- Governments have created regulations, privacy standards and ethics frameworks
- Industry specific standards and frameworks are being developed

Global initiatives for AI ethics

- Responsible computer science challenge
The Institute for Ethical AI & Machine Learning
Berkman Klein Center
European AI Alliance
The Open Robo Institute

Source: DataFlog

Questions?