



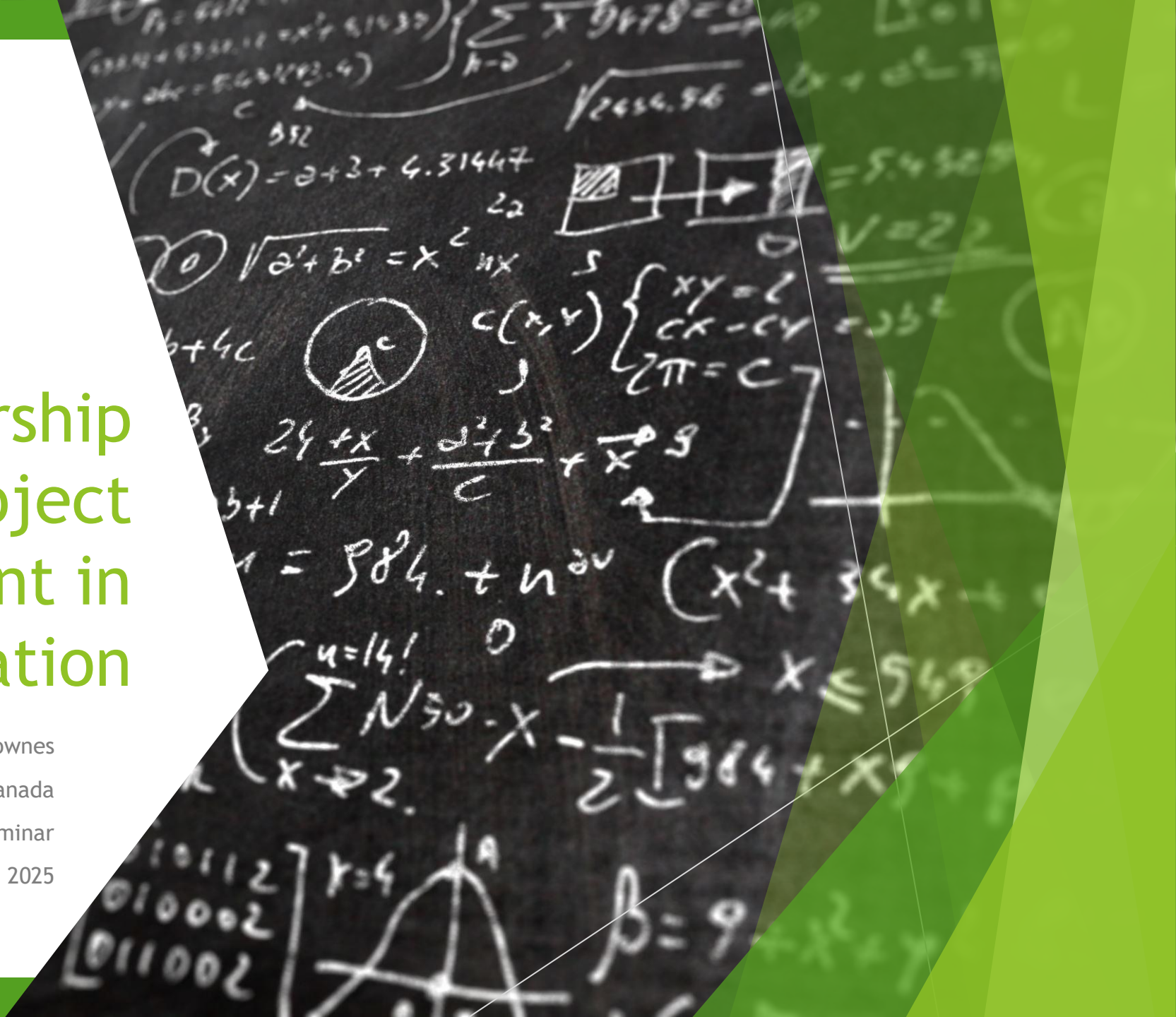
On AI in Leadership and Project Management in Distance Education

Stephen Downes

National Research Council Canada

AU EDDE 804 Doctoral Seminar

January 27, 2025



agenda

- ▶ 'What leadership approach provides maximum support for the exploration and appropriate implementation of AI in education?'

Topics

- ▶ A Bit about What AI Is
- ▶ Some Thoughts about Ethics and AI
- ▶ Using AI
- ▶ What We Learn about Management

A Bit about What AI Is

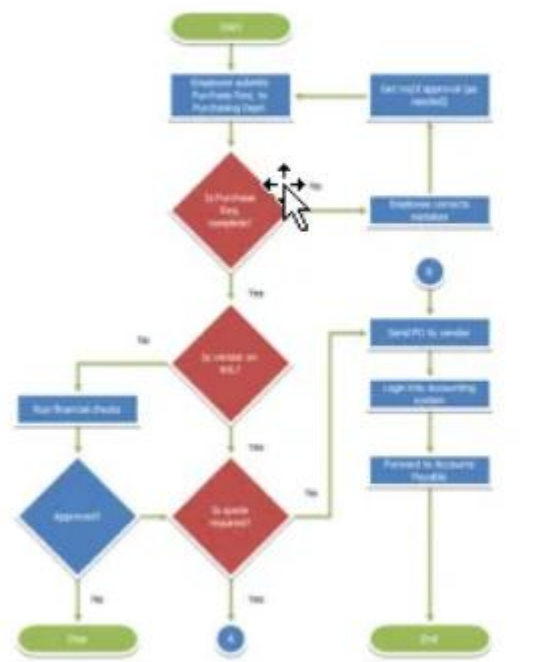
AI is the employment of simple mechanisms in massive arrays to identify patterns in input phenomena, patterns that are, ultimately, useful to us.

A Bit about What AI Is

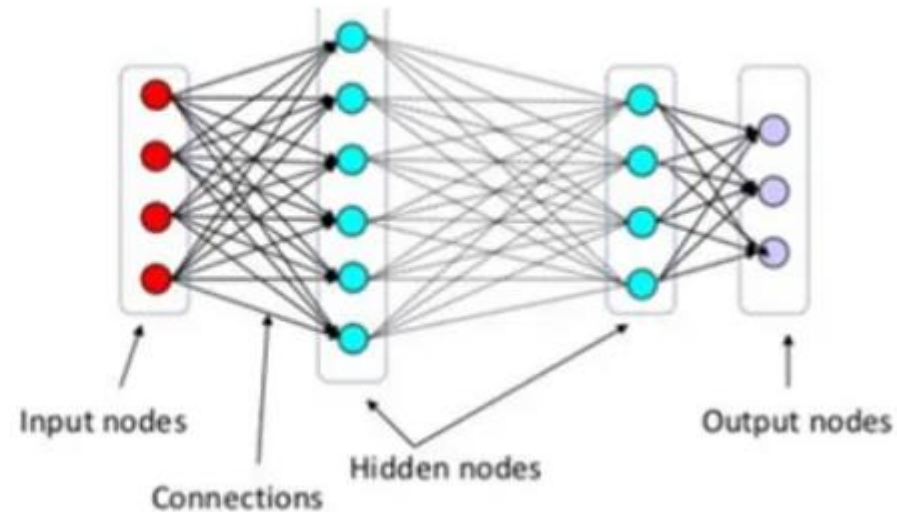
- ▶ GOFAI and Neural Networks
- ▶ Types of AI by Function
- ▶ The AI Workflow
- ▶ The Machine is Us

GOFAI and Neural Networks

Traditional Programming



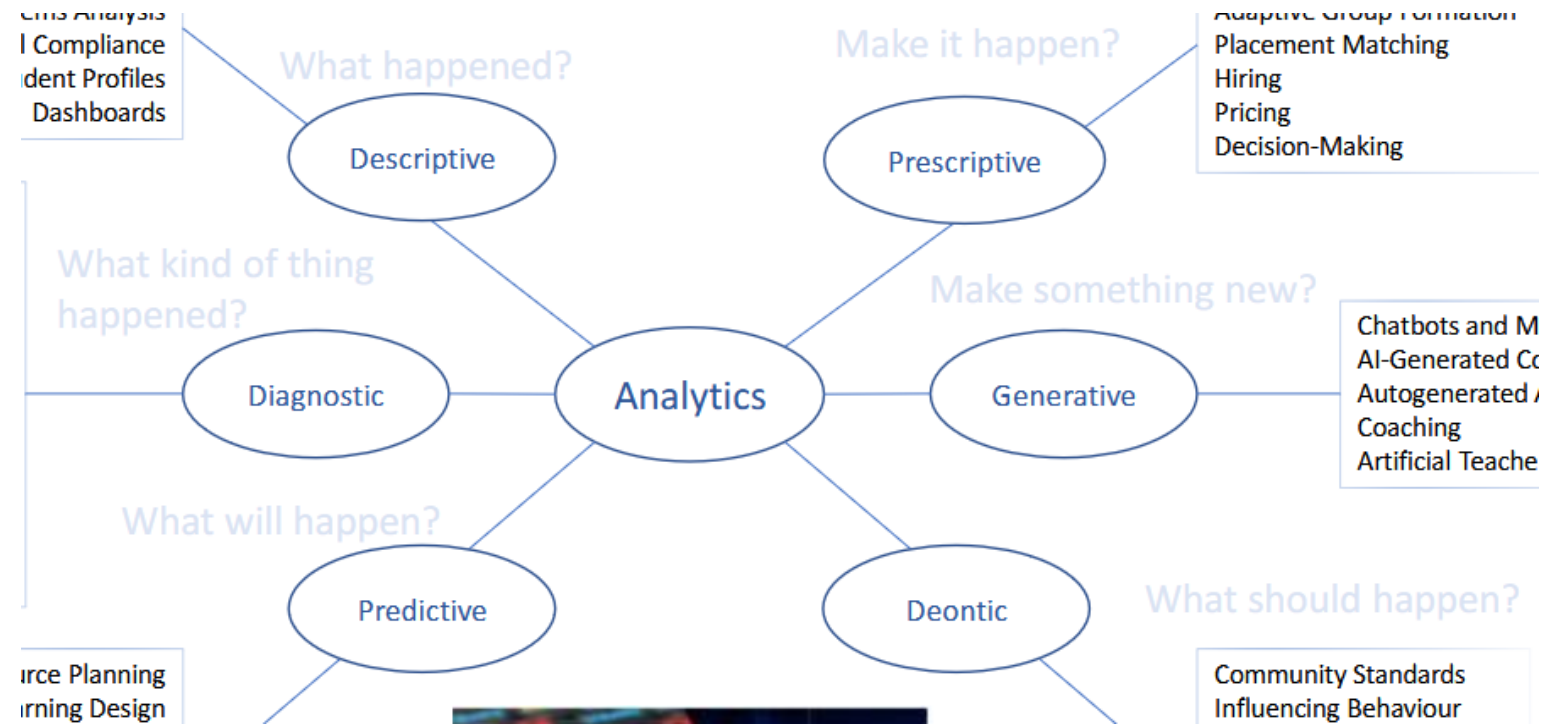
Neural Nets – Deep Learning



<https://becominghuman.ai/the-third-wave-of-ai-1579ea97210b>

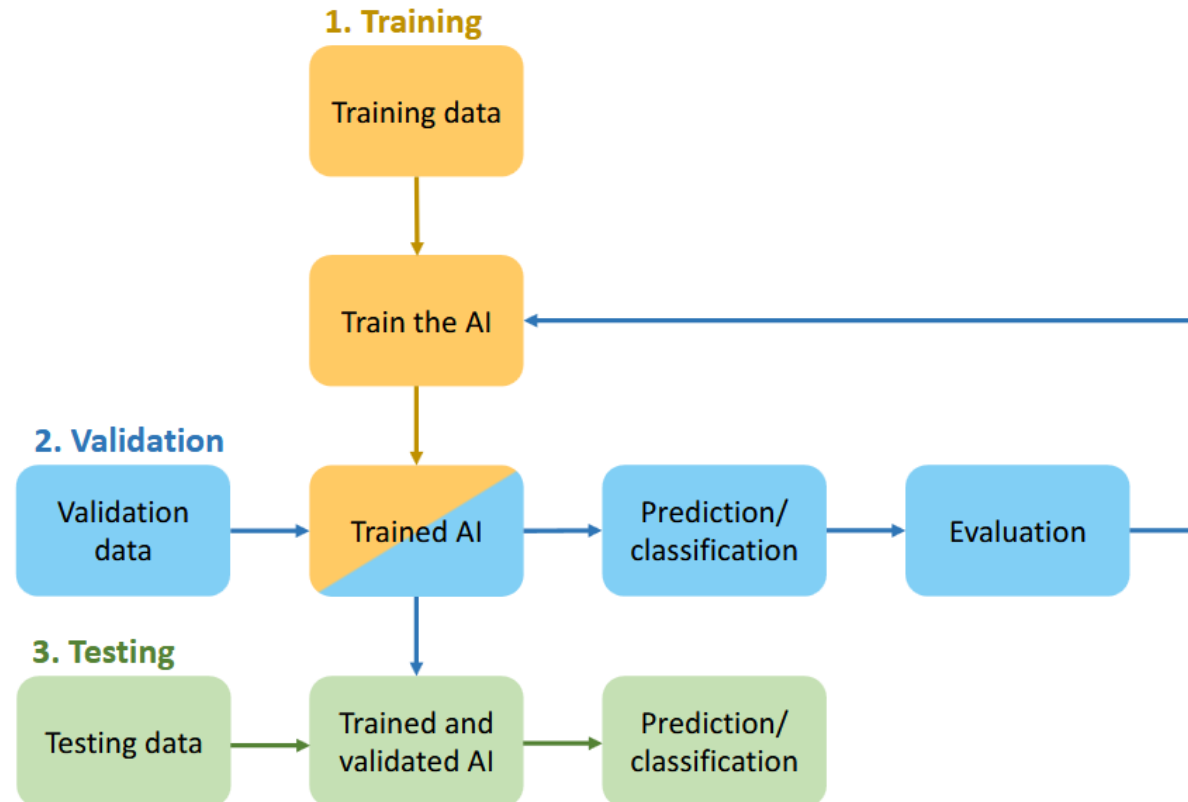
https://ethics.mooc.ca/files/documents/2021_12_03_-_How_AI_Works.pdf

Types of AI by Function



https://ethics.mooc.ca/all_applications.htm

The AI Workflow



https://www.researchgate.net/publication/354983727_Unlocking_the_potential_of_deep_learning_for_marine_ecology_overview_applications_and_outlook

The Machine is Us

It isn't this....



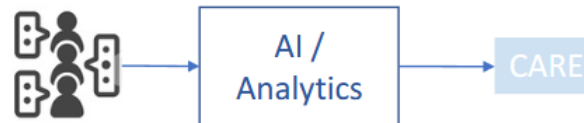
It isn't this



It's this....



It's this



https://ethics.mooc.ca/files/documents/2021_12_01_-_The_Machine_Is_Us.pdf

Some Thoughts about Ethics and AI

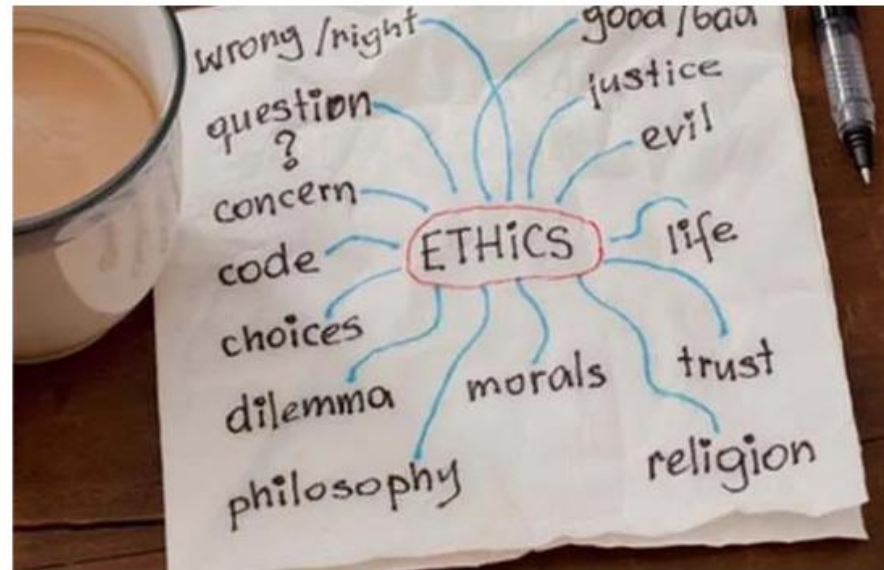
People write about ‘the ethics of AI’ as though the 2,500-year-old question of ethics has been solved. It hasn’t been, and that’s where the danger lies.

Topics

- ▶ Ethical Approaches
- ▶ Metaethics
- ▶ Research Ethics
- ▶ Codes of Conduct
- ▶ Popular Considerations

Ethical Approaches

- The Utilitarian Approach
- The Rights Approach
- The Fairness or Justice Approach
- The Common Good Approach
- The Virtue Approach



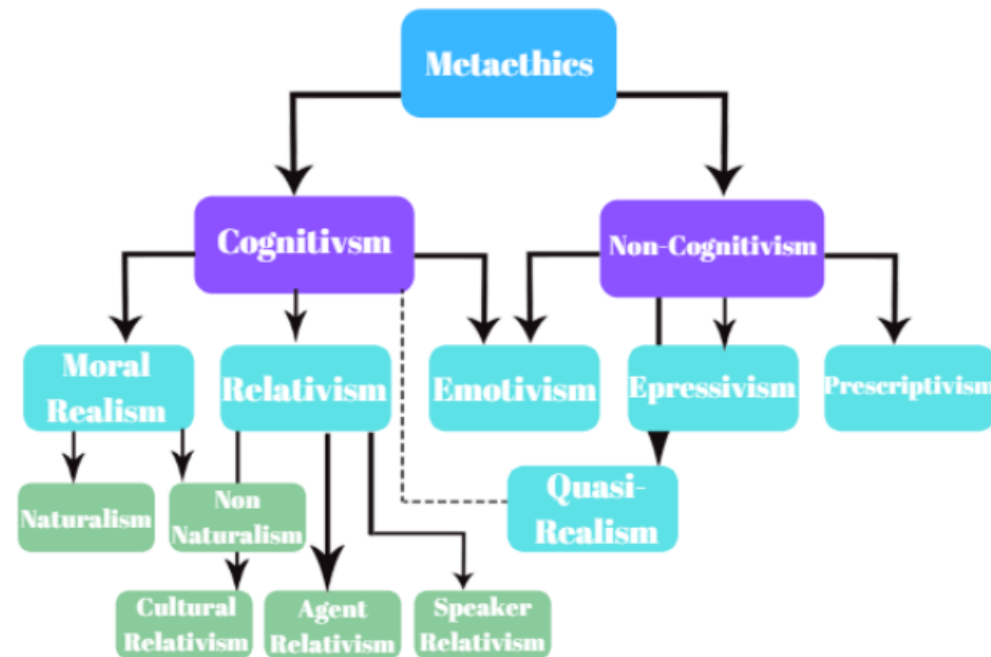
https://ethics.mooc.ca/files/documents/2021_11_08_-_Approaches_to_Ethics.pdf

Metaethics

What is the *basis* for ethical reasoning?

- Does might make right?
- Do ethics describe duties?
- Are ethics based in rights?
- Do ethics require agency?
- Relativism vs Universality

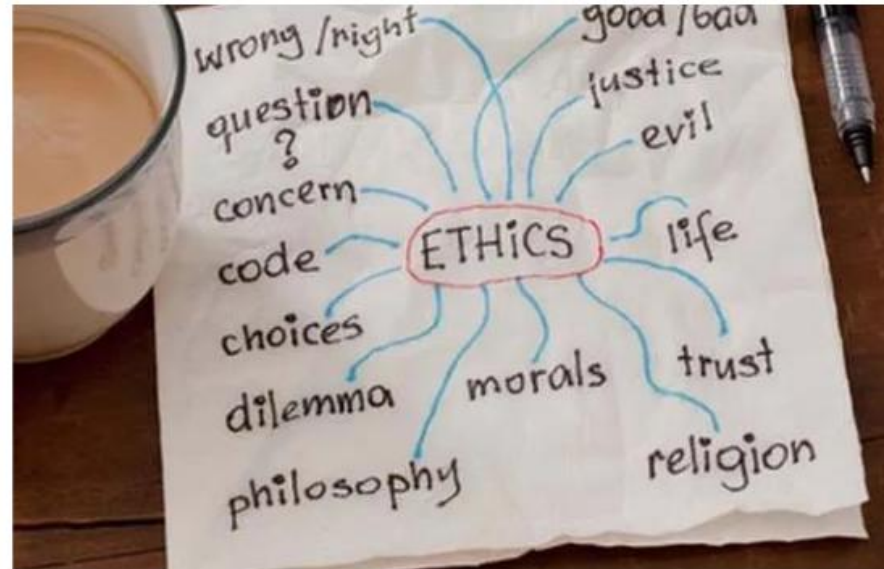
<https://conscientthoughts.wordpress.com/2019/06/10/lets-get-meta-about-metaethics/>



https://ethics.mooc.ca/files/documents/2021_11_08_-_Approaches_to_Ethics.pdf

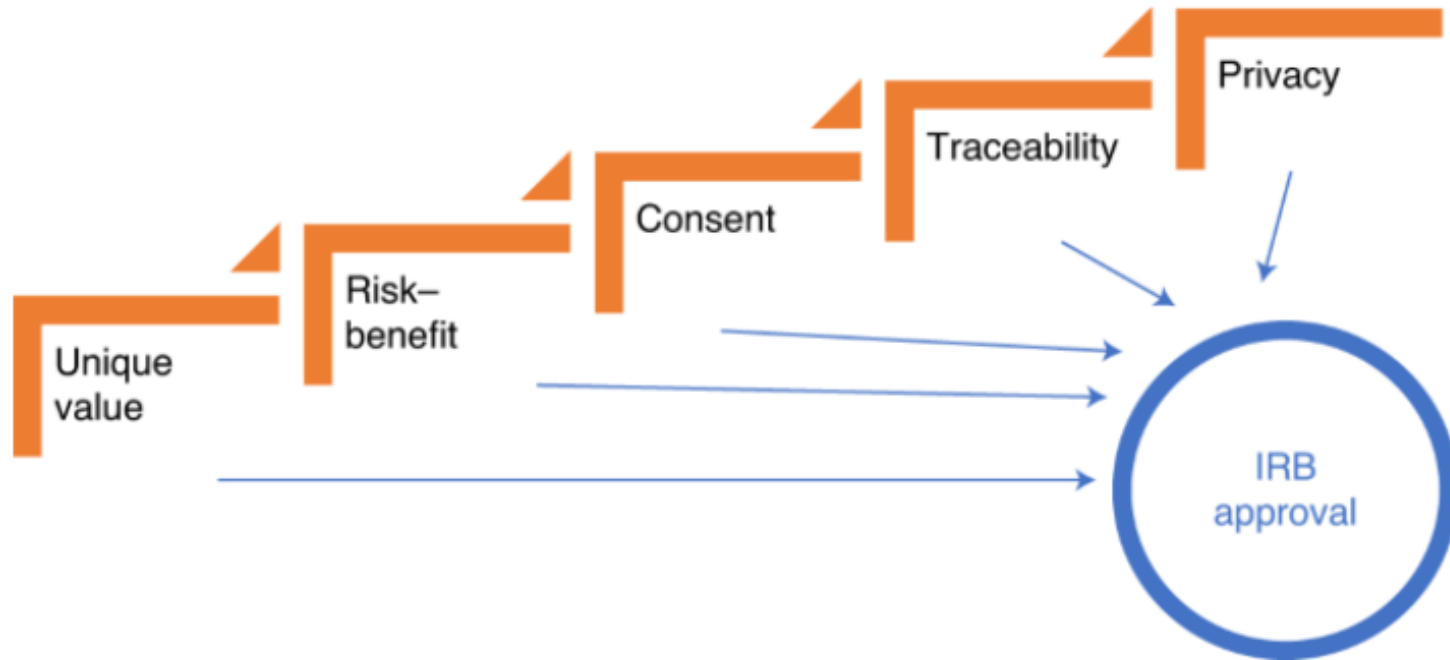
Codes of Conduct

- The Utilitarian Approach
- The Rights Approach
- The Fairness or Justice Approach
- The Common Good Approach
- The Virtue Approach



https://ethics.mooc.ca/files/documents/2021_11_08_-_Approaches_to_Ethics.pdf

Research Ethics



<https://www.nature.com/articles/s42256-021-00389-w>

Codes of Conduct

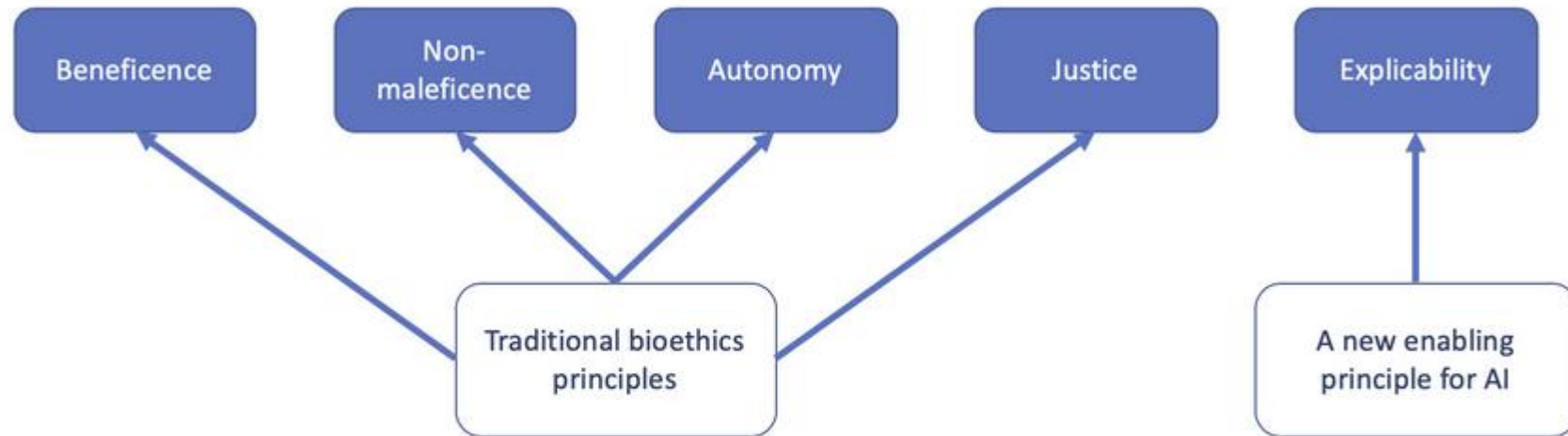
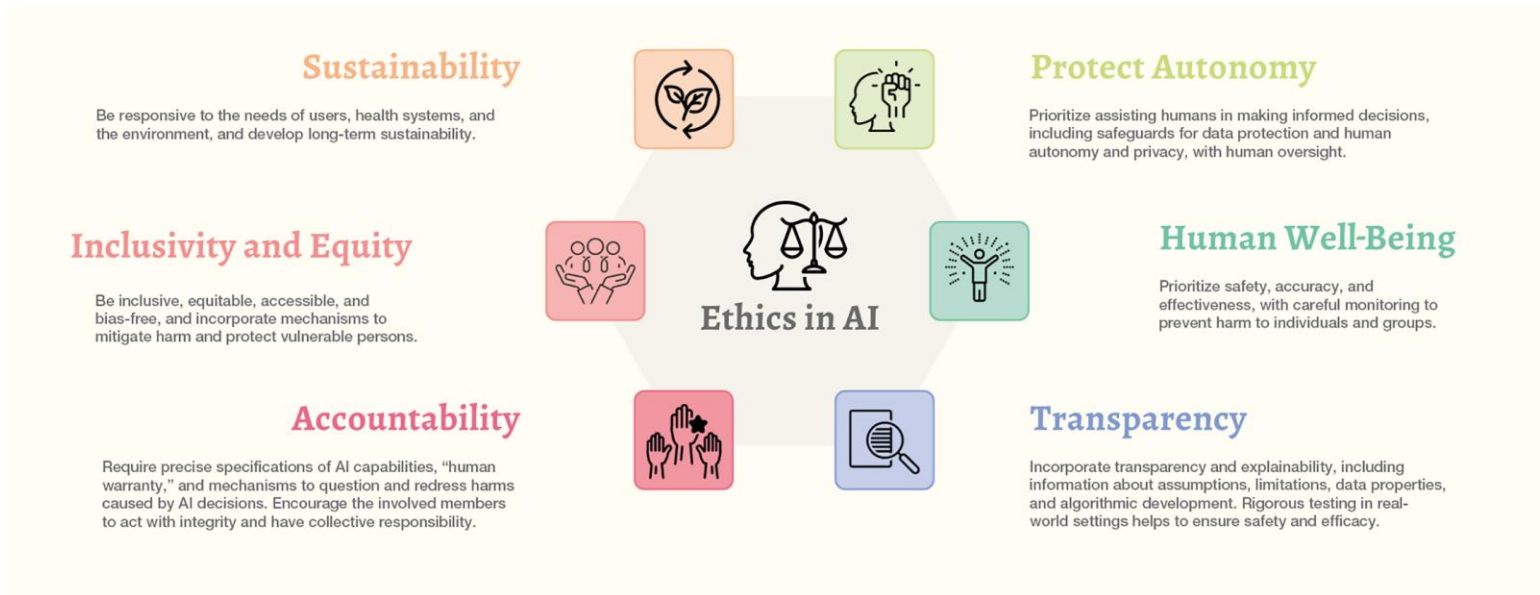


Figure 2: An ethical framework of the five overarching principles for AI which emerged from the analysis.

Floridi <https://hdr.mitpress.mit.edu/pub/l0jsh9d1/release/8>

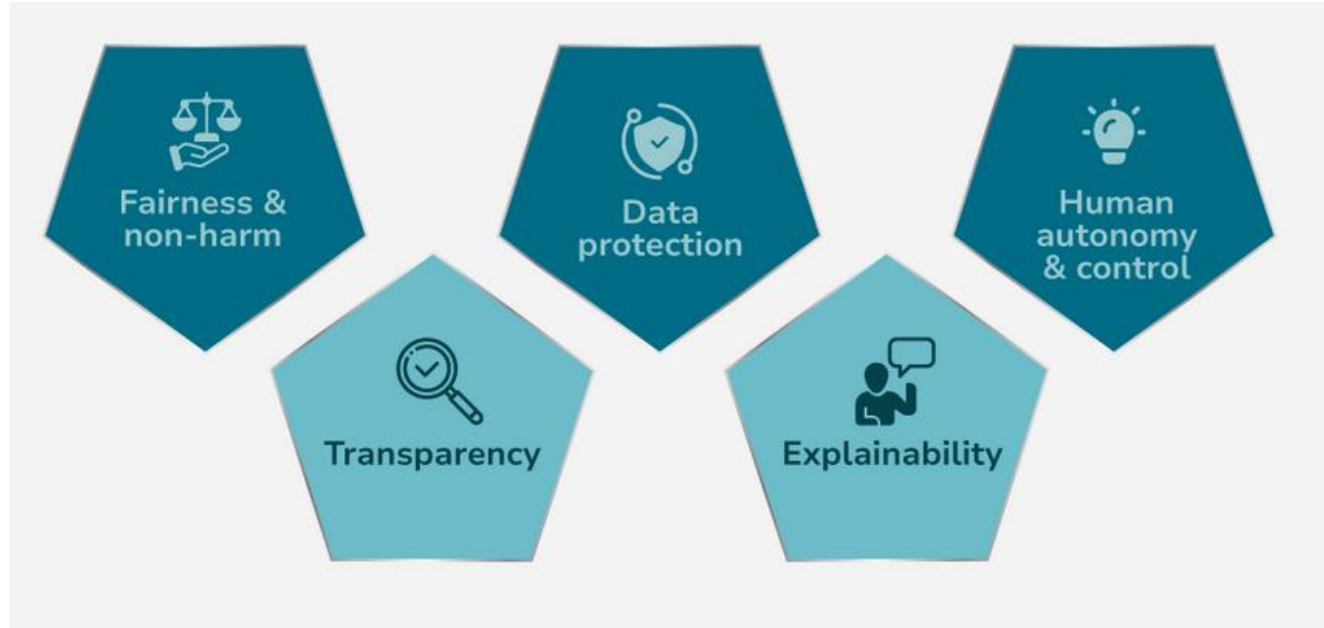
<https://docs.google.com/document/d/1mv9VxblyGvBaFwHSvtyN1a3iwAKws6SZDGuDTlYMZ48/edit?tab=t.0#heading=h.kvjt8s5cioo5>

Popular Considerations



<https://dailynews.ascopubs.org/do/released-framework-ethical-use-ai-medicine-oncologists-must-adapt>

Popular Considerations



<https://www.geeksforgeeks.org/ai-ethics/>

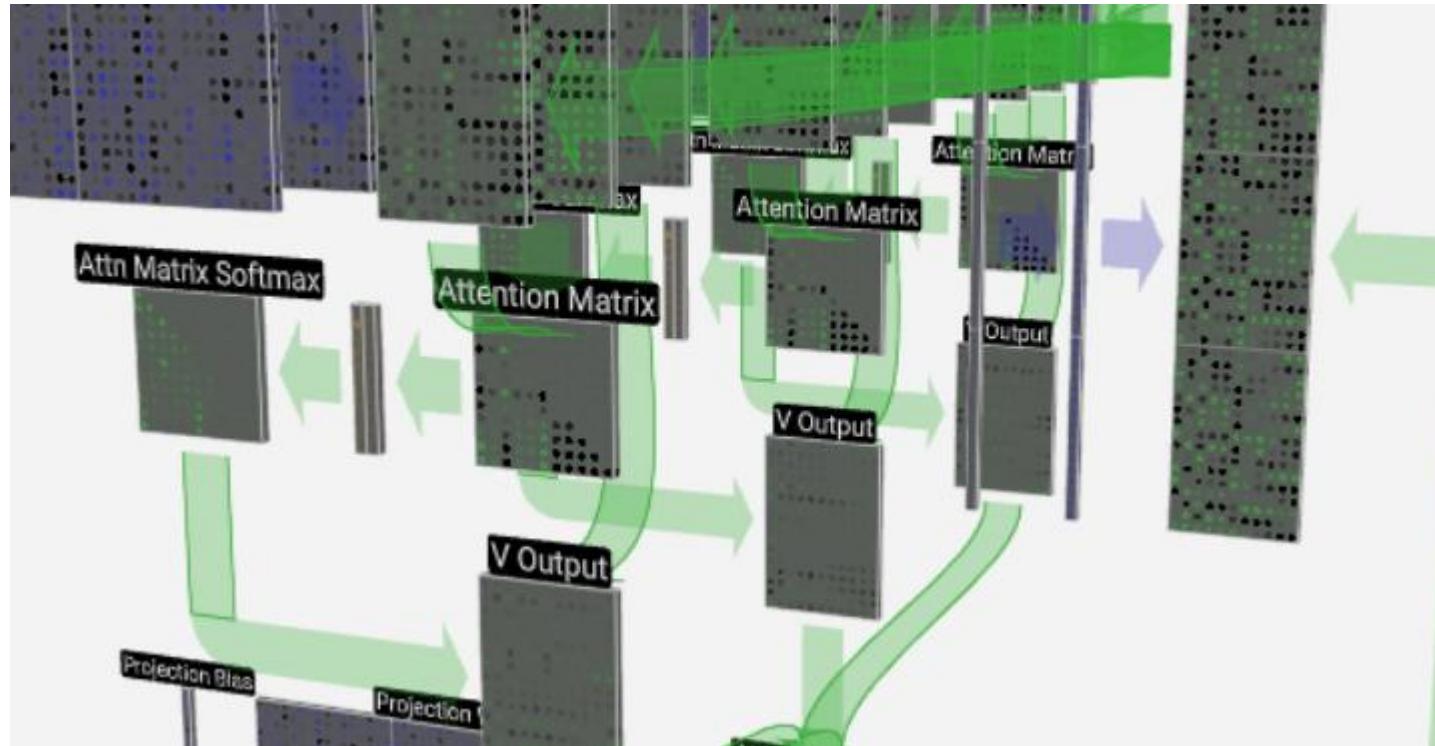
Using AI

When we use AI, we don't just push a button and 'use AI'. It fits into our other work and processes and functions somewhere between a tool and a forgetful but skilled assistant.

Topics

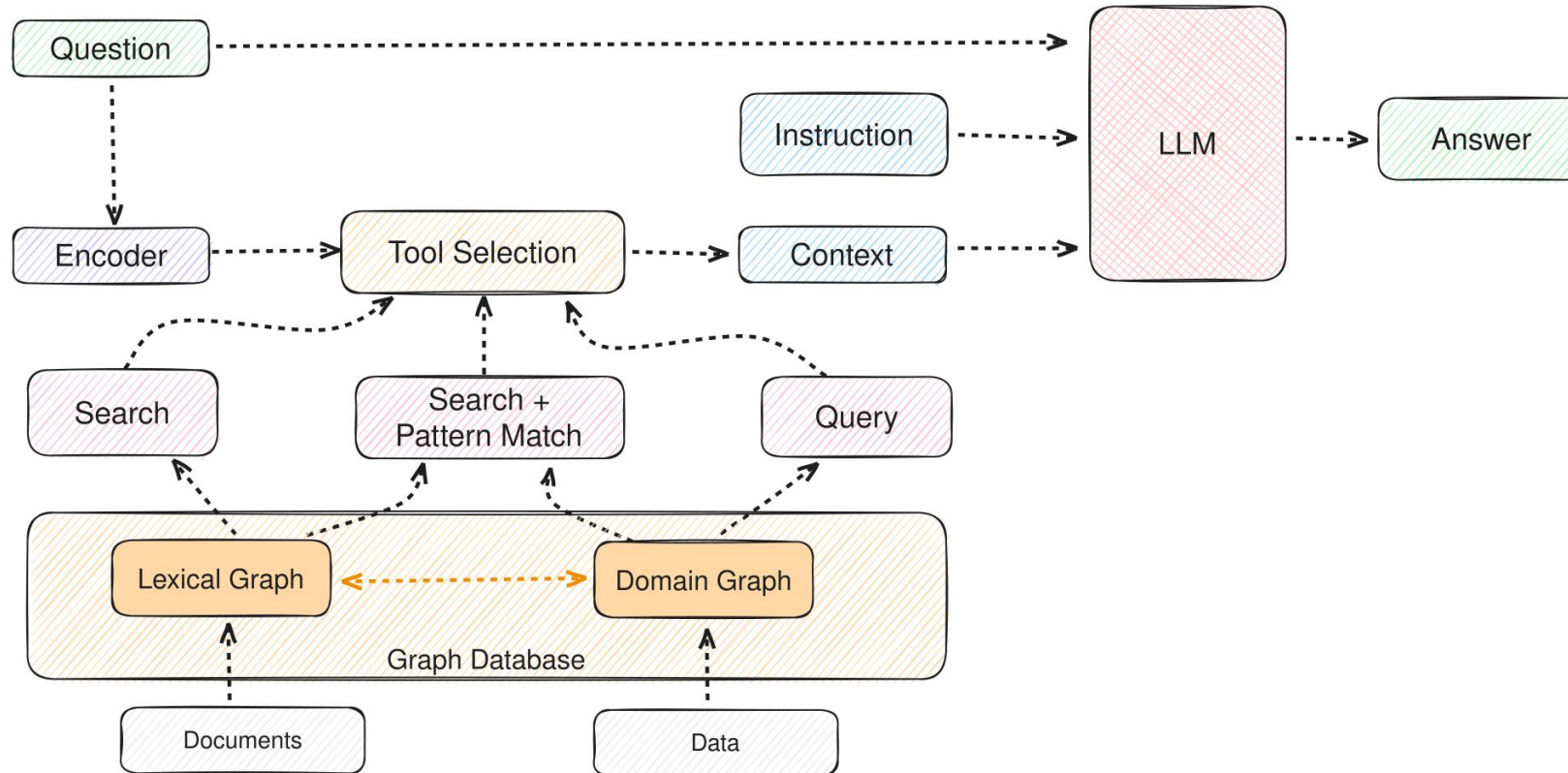
- ▶ AI as a Pattern Recognizer
- ▶ Resource Augmented Generation (RAG)
- ▶ Prompt Engineering?
- ▶ AI in the LOOP

AI as Pattern Recognizer



<https://www.downes.ca/post/77537>

Resource Augmented Generation



https://en.wikipedia.org/wiki/Prompt_engineering

Prompt Engineering?

Tactics:

- Include details in your query to get more relevant answers
- Ask the model to adopt a persona
- Use delimiters to clearly indicate distinct parts of the input
- Specify the steps required to complete a task
- Provide examples
- Specify the desired length of the output

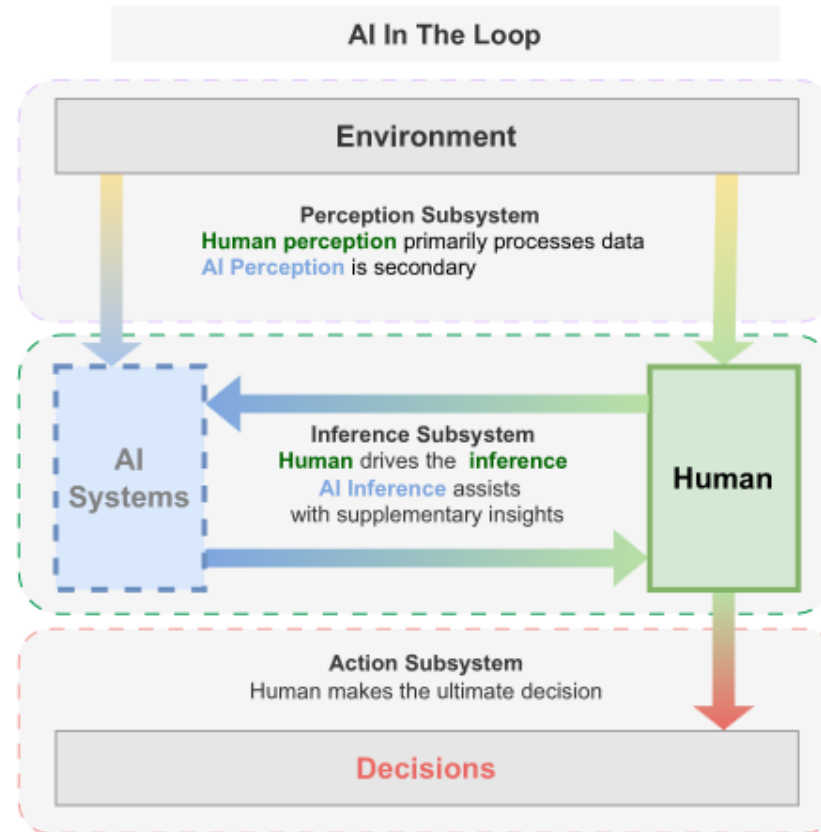
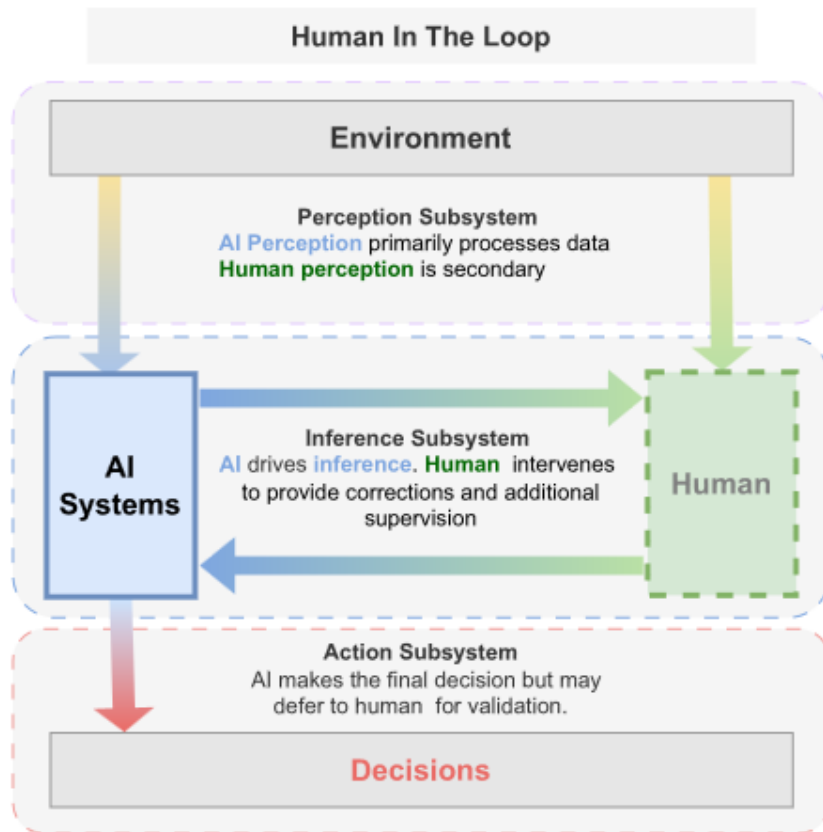
<https://platform.openai.com/docs/guides/prompt-engineering>

Practical AI

The screenshot displays a web application interface with a light grey background and green accents. On the left, a sidebar contains a 'Manage Accounts' section with a 'Permissions' input field, 'ACCESS CODE' and 'Access Code' labels, and 'Add Account' and 'Reset Form' buttons. Below this is an 'Accounts' list with buttons for 'Downes', 'Google Translate', 'OLDaily', 'Cosocial', 'Leftish', 'Half an Hour', 'OpedEd', 'Cogdog', and 'ChatGPT'. The main content area is divided into two columns. The left column shows a 'Home Feed' with two posts: one by Molly White (@molly0xffff@hachyderm.io) and another by Dave Lane (@flag_ting@mastodon.nzoss.nz). The right column features a 'Post Content' panel with a 'Title (Optional)' field, a list of 'Existing Pads' (555555, Harry, TWO, TestingOnceAgain, aaaaaa, bbbb, bubba, hMbdq_xjz_BXvQJ89GBb, yyyyyy, zzzzzz), a 'Create a New Pad' section with an input field and 'Create and Load' button, and a 'Post Content' section with a 'Publish' button and a 'saveResult' label.

<https://ple.mooc.ca/static/>

AI in the Loop



<https://www.downes.ca/post/77448>

What We Learn about Management

If management is the creation of conditions to produce outcomes, how does that proceed when principles of cause and effect don't seem to apply?

Topics

- ▶ Self-Organization
- ▶ Management as Modeling
- ▶ Explainability
- ▶ Self-Governance and Self-Reliance

Self-Organization



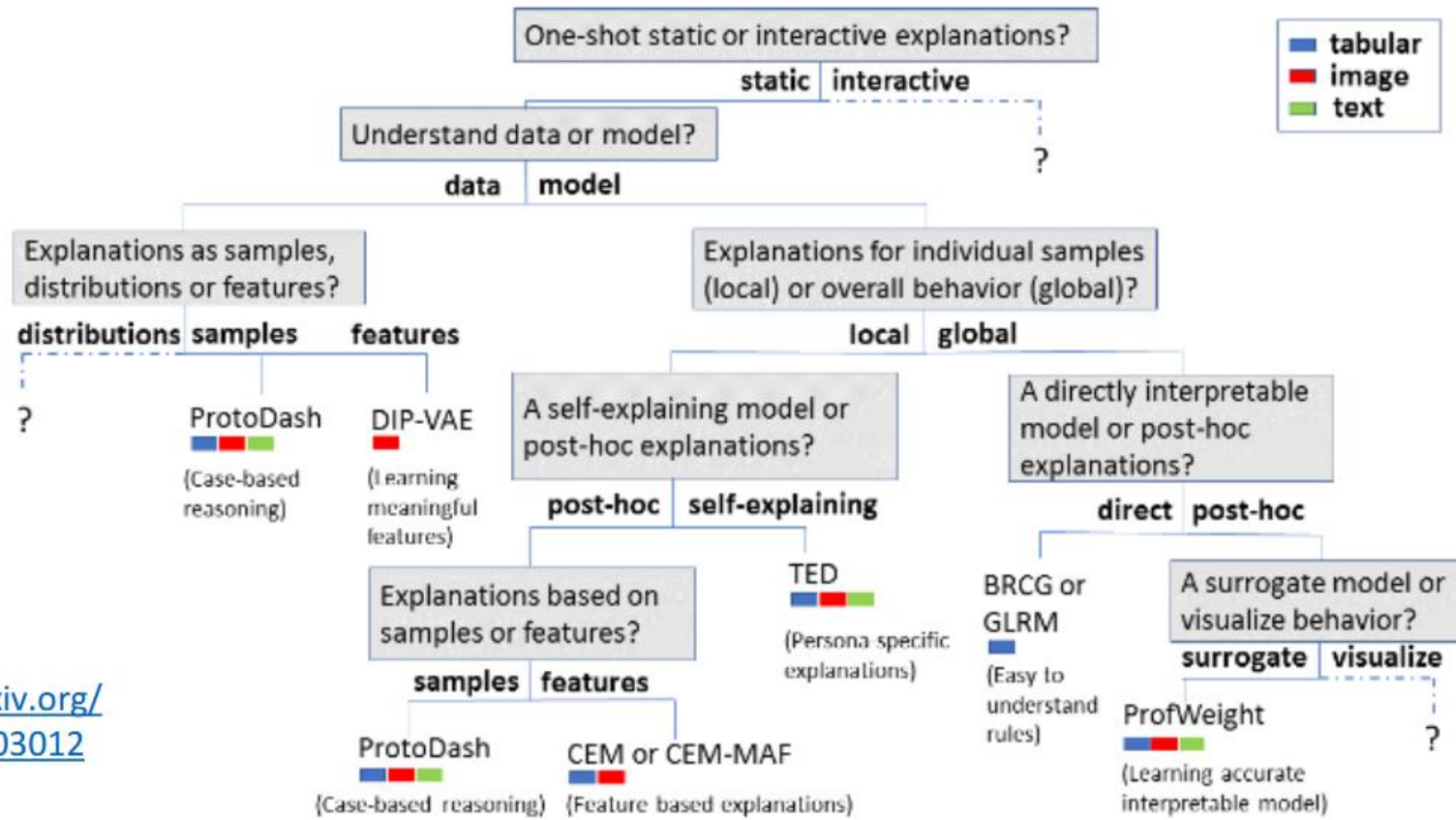
<https://giphy.com/clips/storyful-bird-migration-common-starling-f32WjwloL8Bi428PrM>

Management as Modeling

- **Testing** – people try it and report what's not working
- **Features** – what things do people want most? Roadmap.
- **Applications** – stories describing what it's used for
- **Development** – people suggest fixes and improvements on Github
- **Documentation** – make it easy for people to use
- **Security** – experienced developers lock it down
- **Services** – other people (not just me) host supporting applications
- **Expansion** – other people (not just me) write JS support apps
- **Publicity** – we let people know what's possible
- **Governance** – so this belongs to the community, not just me

https://www.downes.ca/files/docs/CList_Launch.pdf

Explainability



[xiv.org/.03012](https://arxiv.org/abs/1909.03012)

<https://arxiv.org/abs/1909.03012>

Explainability

Engineering	Deployment	Governance
Ensure efficacy Improve control Improve performance Discover information	Explain its rationale Characterize strengths and weaknesses Inform future expectations Promote human-machine cooperation	Promote trust Protect against bias Follow regulations and policies Enable human agency

Ultimately, what will count as an explanation will depend more on who is doing the asking and explaining than on any inherent property of the system

https://ethics.mooc.ca/files/documents/2021_12_15_-_Explainable_AI.pdf

Self-Governance and Self-Reliance

Engineering	Deployment	Governance
Ensure efficacy Improve control Improve performance Discover information	Explain its rationale Characterize strengths and weaknesses Inform future expectations Promote human-machine cooperation	Promote trust Protect against bias Follow regulations and policies Enable human agency

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https://ethics.mooc.ca/files/documents/2021_12_15_-_Explainable_AI.pdf



Thank you

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