# The Means of Prediction How AI Really Works (And Who Benefits)

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#### Why I wrote this book

- Key societal decisions about AI need to be made.
- Researchers should contribute to a society where we collectively decide our own future.
- This book aims to empower people to participate in the AI debate.
- Connecting:
  - The foundations of machine learning
  - to the means of prediction required for AI
  - to a unique economic perspective on the regulation and democratic control of AI.

A popular dystopian story:

- AI will attain superhuman capabilities,
- will start to self-improve exponentially,
- and will threaten human existence in the name of self-preservation.

- Such stories touch on our deepest fears:
  - Losing our livelihoods, autonomy, lives, and loved ones,
  - to inscrutable and inevitable forces.
- But they don't enable good decisions:
  - Make it seem like AI and its use are fate.
  - Obscure conflicts over who controls AI.
- Intentional obfuscation by tech players?

- 1. Al is automated decision-making using optimization.
- 2. Who gets to pick the *objectives* of AI?
- 3. Controversies and dangers:
  - Computer science: "Problems are optimization errors."
  - My book: "Key issue is the choice of objective."
- 4. We need democratic control of objectives.

#### Some examples

Beyond the headline-grabbing large language models:

- Algorithmic management of gig-workers.
- Automatic screening of job candidates.
- Filtering and selection of social media feeds, search engine results.
- Ad targeting.
- Predictive policing and incarceration.
- Automated choice of bombing/assassination targets (e.g. Gaza)

#### How AI works

The book explains the foundations of machine learning and AI without math:

- Al is automated decision-making, maximizing some reward.
- Machine learning is AI using statistics.
- Supervised learning: Prediction
  - Overfitting versus underfitting, tuning.
  - Deep learning, transformers.
- Online learning: Choosing actions over time.
  - Exploration versus exploitation.
  - Planning.

#### The means of prediction

- These foundations clarify what resources are needed for AI:
  - Data
  - Compute
  - Expertise
  - Energy
- Implications:
  - Potential for future improvements (domain-dependent).
  - Control of AI by controlling its inputs.
  - Contests over property rights, externalities.

# Agents of change

Who can align AI objectives with social welfare?

- Interests, values, and strategic leverage.
- Al companies? Constrained by profit maximization.
- Should address others:
  - Workers (click-, gig-, tech-), consumers,
  - media and public opinion, state and law.
- Ultimate goal:
  - Democratic control of AI objectives
  - by those impacted by AI decisions.

## Ideological obfuscation

- Ideology: Represents
  - Interests of a particular group as those of society at large.
  - Contingent choices as objective necessity.
  - Social relationships as technical ones.
- Popular AI stories that prevent change:
  - 1. Man versus machine: Obfuscates conflicts within society.
  - 2. Intelligence explosion: Not human choices but autonomous process.
  - 3. Only experts understand AI: Prevents democratic control of tech companies.
  - 4. If we don't do it, China will: Political inevitability.

## Regulating algorithms

Ramifications of this perspective for various policy domains:

- Value alignment and the limits of AI
- Privacy and data ownership
- Workplace automation and the labor market
- Fairness and algorithmic discrimination
- Explainability of algorithms and algorithmic decisions

### Example: Privacy and data ownership

- Differential privacy:
  - (Almost) no observable difference whether your data are in a dataset.
- Individual property rights (e.g. GDPR):
  - Control over whom to share data with.
- But: Learning is all about the externalities.
  - Learning patterns, not individual observations.
  - Individual privacy / property rights cannot prevent harms from AI.
  - Need collective democratic governance of data.

### Example: Explainability

- 1. Explaining decision functions:
  - Simple approximations to complicated functions.
  - Motivated by incompletely specified objectives.
- 2. Explaining decisions:
  - · How would inputs need to change, to change decision?
  - Motivated by individual recourse.
- 3. Explaining decision problems:
  - What is the objective, action space, data used?
  - Motivated by collective democratic control.

# Thank you!

Book available for pre-order here:

https:

//press.uchicago.edu/ucp/books/ book/chicago/M/bo255887145.html



