



AI Transformations in the Software Industry

A Practitioner's Journey

Jeremiah Edwards

ALDHack2021, TeensInAI

ML Systems are for Humans

“Programs are meant to be read by humans and only incidentally for computers to execute.”

- Donald Knuth

"As leaders, it is incumbent on all of us to make sure we are building a world in which every individual has an opportunity to thrive."

- Andrew Ng

In this talk

sage

1. Introductions
2. Historical Context
3. The Paradigm shift
4. Challenges and Opportunities: AI for good



Who am I?

- Jeremiah Edwards
- Machine Learning Architect at Sage AI Labs (SAIL)
- Previously: Covid Act Now, FLYR, Sqelch, Aptelligent/VMware, etc.
- Background in pure and applied mathematics
- ...=> number theory => optimization => data science
=> ml => distributed systems => ml => privacy and ethics => ... => ???

Twitter: [@JeremiEdwards](#)

GitHub: [jeremiq](#)

LinkedIn: [jeremiq](#)



Who is Sage AI Labs?

sage

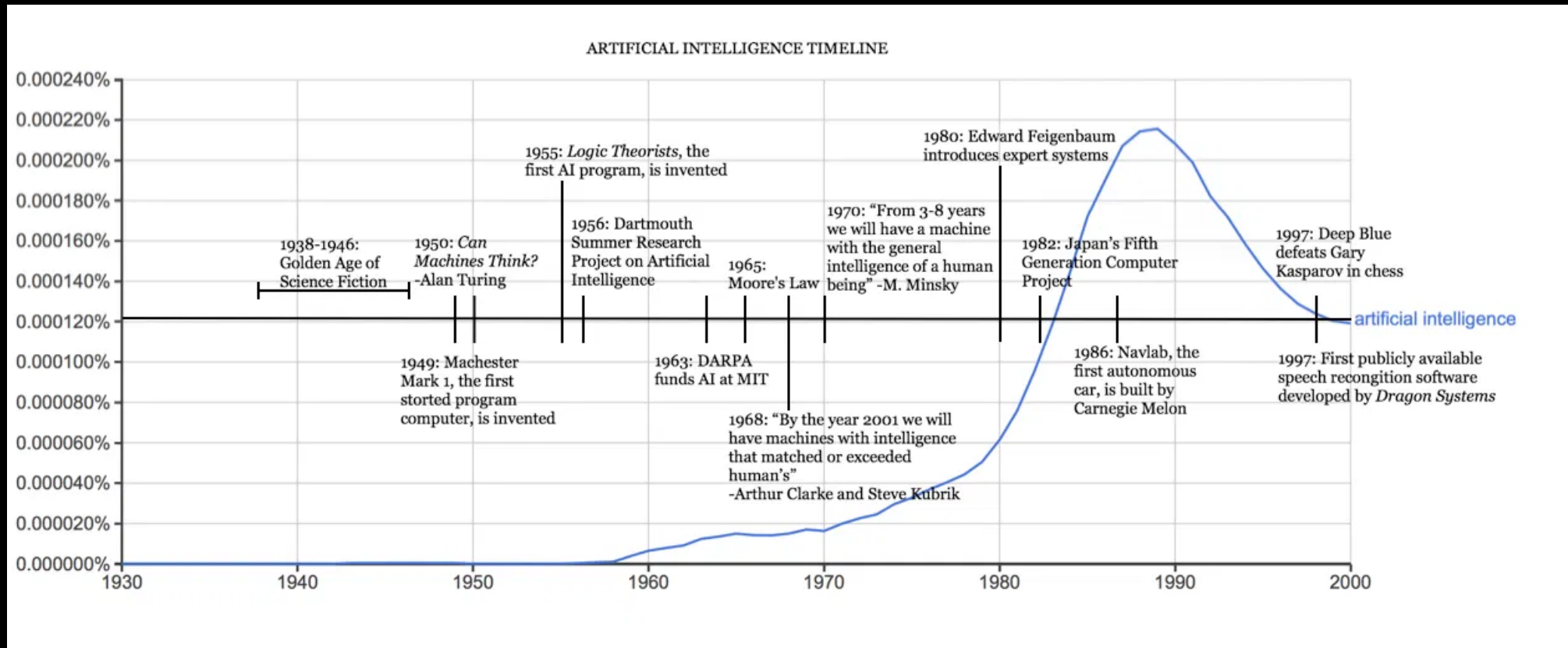
Sage provides AI-powered financials, planning, analytics, and HR products to our customers

SAIL develops the ML and AI capabilities that power those products.

Photo: Sage's 1st AI offsite in Barcelona



(An) AI Timeline



src: harvard SITN



Filling in some gaps

- An Essay towards solving a Problem in the Doctrine of Chances (Bayes, 1763)
- Poetical Science (Lovelace, ~1842)
- ...
- Programming standards and compiler development (Hopper et al., ~1943-1986)
- Protecting privacy when disclosing information: k-anonymity...(Sweeney, 1998)
- Calibrating Noise to Sensitivity in Private Data Analysis, Differential Privacy (Dwork et al., 1998)
- On the Dangers of Stochastic Parrots: Can Language Models Be Too Big? 🦜 (Gebru et al. 2021)



$$P(A | B) = \frac{P(B | A) P(A)}{P(B)}, \text{ if } P(B) \neq 0.$$



TRADITIONAL PROGRAMMING

AI is A new Paradigm



MACHINE LEARNING

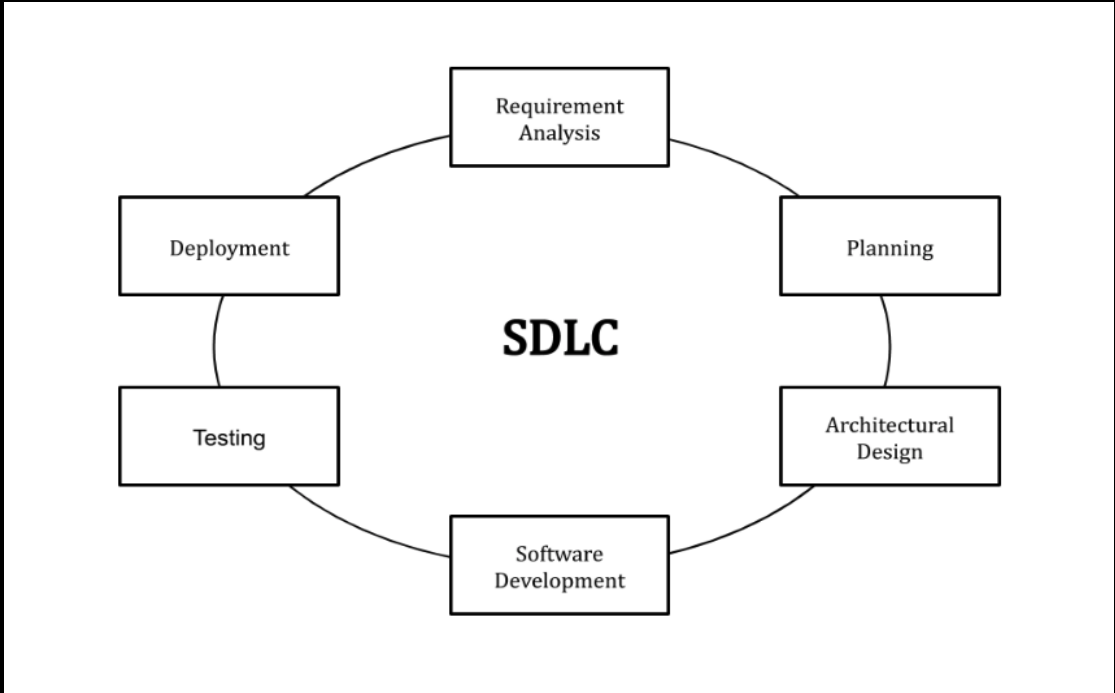


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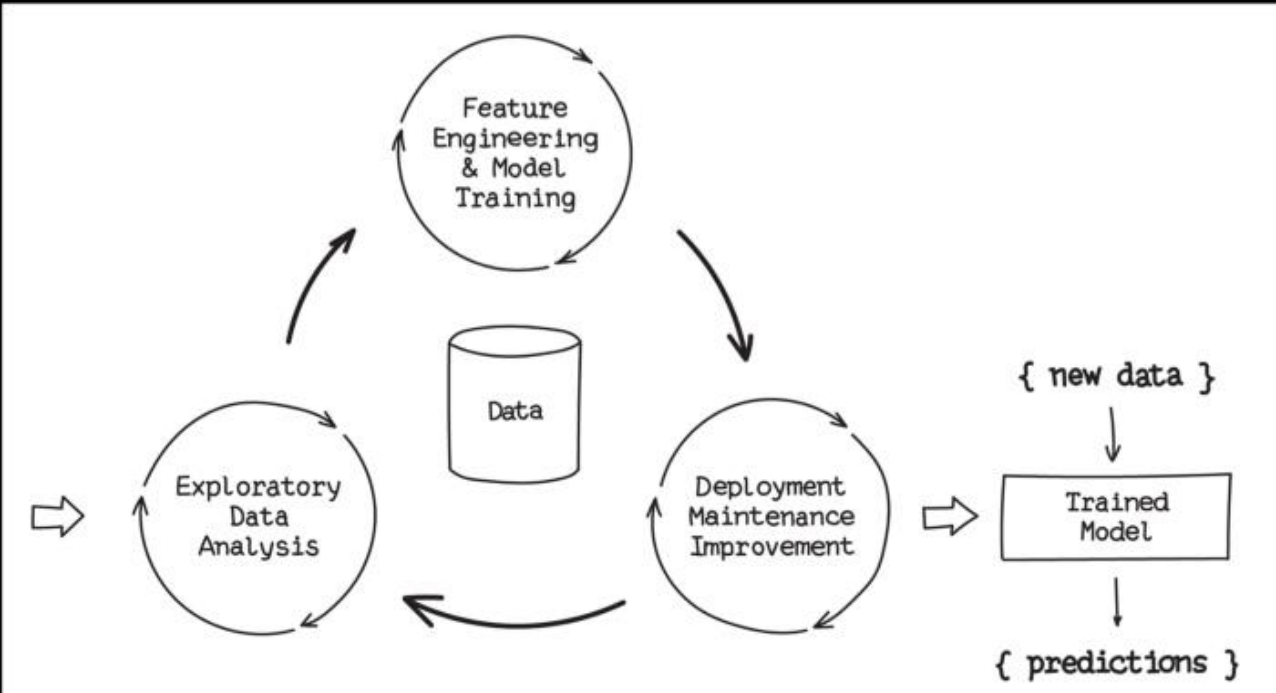


Software Development vs. AI Model Development

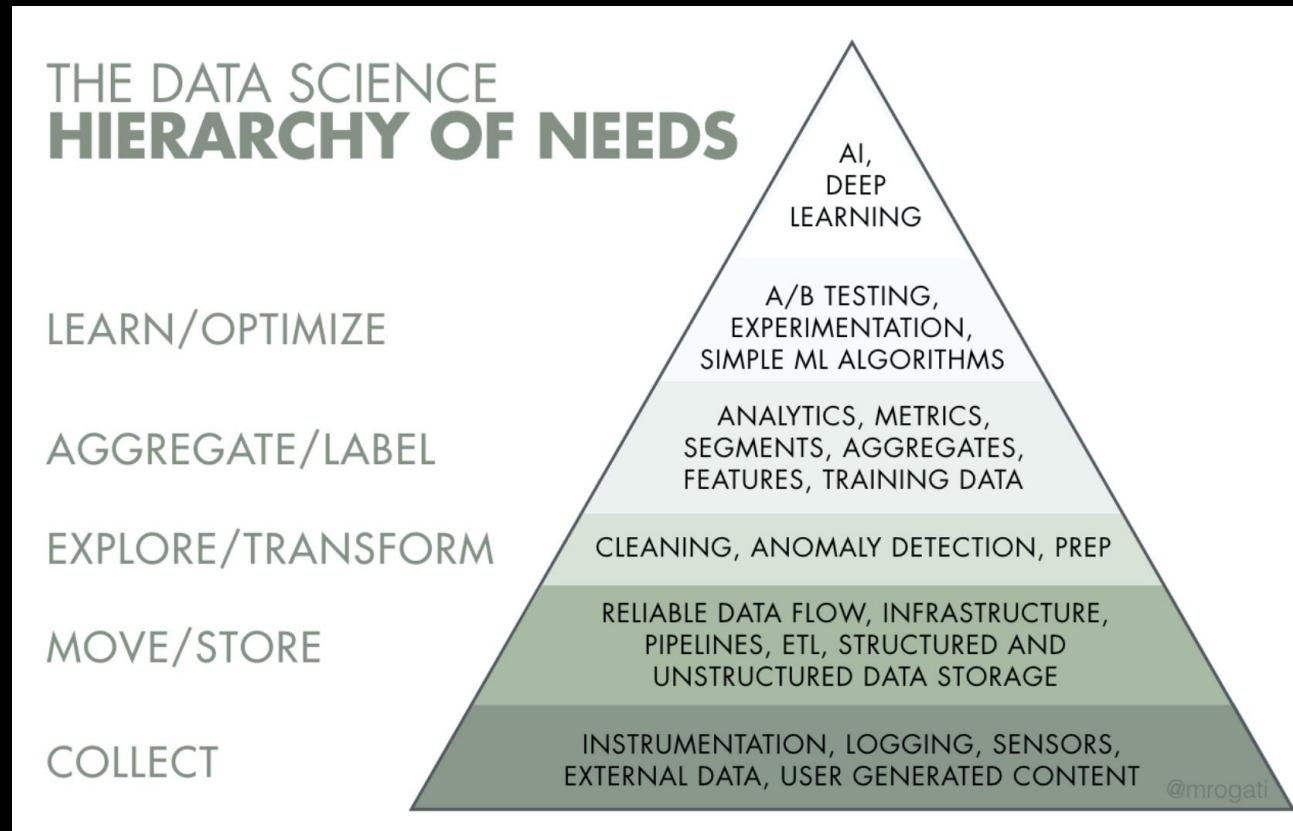
Traditional Software



AI/ML



Data and Infrastructure are Foundational



[src: Monica Rogati](#)



- Data Collection and transparency
- Accounting for biases in data *and* algorithmic bias
- Ethical and legal data management and use – GDPR, CCPA, Schrems II, etc.
- Privacy by Design
- Ethical model *design* and *development* practices and oversight



ML Systems are for Humans



Thank you

These slides <https://github.com/jeremiq/aldhack2021>