The future of planning methods? Big data, machine learning and AI

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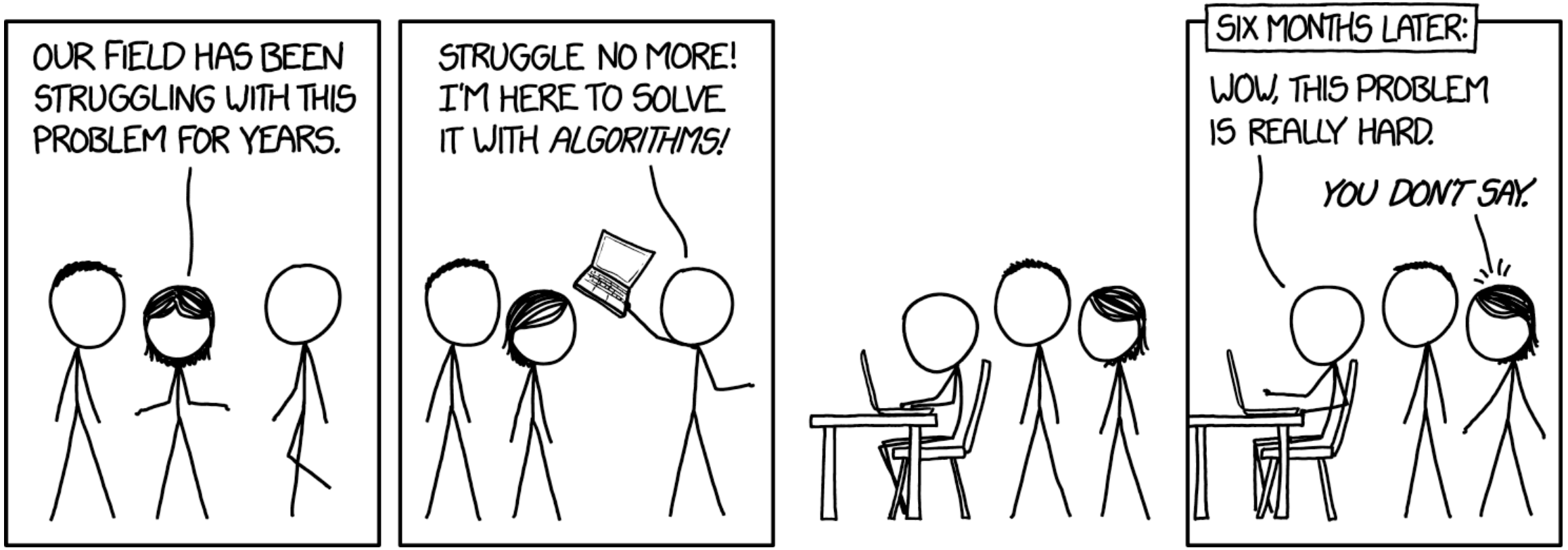
What's all the hype?

- In recent years, computational power and new data sources have become widespread
- There's been a lot of hype about using this in planning, as well as just about every other field



Big data

Novel data sources

- I prefer to think of most things people call “big data” in planning as “novel data sources”
- These might include
  - Sensor data
  - Smartphone data
  - Connected vehicle data
  - Social media data
  - Crowdsourced data

Advantages of novel data sources

- Often very timely (maybe e.g. from last month, or even last week)
- Extensive—often orders of magnitude more observations than we could get otherwise

Limitations of novel data sources

Machine learning

- We make a lot of restrictive assumptions when we do regression (linearity, lack of interactions, etc.)
- As data and computation have become more available, machine learning has developed as a set of techniques to relax those assumptions
- Machine learning is *heavily* focused on prediction

Advantages of machine learning

Disadvantages of machine learning

Other advantages to machine learning: data types

- Data types are more varied—for instance,
  - identifying vehicle types from street view imagery, or
  - identifying illegal logging from hidden microphones

Applications of machine learning in planning

- Best used when prediction really does matter
- Often used for imputation (filling in missing data)
- Some newer causal inference tecniques rely on machine learning as well
- Self driving cars?

AI

- It’s still too early to see how ChatGPT and other AI tools affect planning
- I think AI is going to be a big help to researchers dealing with text data
  - Data extraction, qualitative coding, etc

AI on AI

- I asked ChatGPT how ChatGPT would affect urban planning
- I didn’t buy most of what it said, but one thing that was interesting was scenario planning
- AI tools could be used to develop, evaluate, and visualize scenarios

AI and visualization - 2023

This took less than an hour with Stable Diffusion

AI and visualization - today

This took a few minutes with Copilot

References