AI in the Court

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How to create artificial intelligence

- Recent AI developments
  - Computer vision
  - Speech recognition
  - Driverless cars
  - AlphaGo

  …
- Two approaches of creating AI
  - Rule-based approach
  - Machine learning
- Rule-based approach
  - Rules are hand-crafted by human experts
  - Time consuming, expensive, and sometimes does not work

Machine learning

- To let computers “learn” by themselves without being explicitly programmed
- Requirements
  - Massive computing power
  - Huge amount of data
  - Learning algorithms: logistic regression, decision tree, neural network…
- Most modern AI application are based on machine learning with neural networks.

Understanding natural language

- Turning each word into a long series of numbers through its relations with its context

  Eg: Paris: [10,2]

  France: [7,2]

  China: [3,5]

  Beijing: [6,5]

- Such numbers (“Word Vector”) capture the “true meaning” of the word

  Paris – France + China = ?

  Human: *Capital of France – France + China = Capital of China*

  Computer: *Paris [10,2] – France [7,2] + China [3,5] = [6,5] (Beijing)*

Legal AI

- Decision prediction
  - AI predicted 70% of the US Supreme Court decisions from 1816 until 2015

    Cf. legal experts: 66% accuracy
  - 79% accuracy rate at predicting European Court of Human Rights
- Legal research
- Document automation
- Text analytics

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Case study: Compas

- What is Compas
  - A reoffending risk assessment software tool designed by a private company called *Equivant*
  - Widely used in the US court systems
  - Analyse over 100 features (such as gender, age, past criminal history…)
  - Generate a risk score of reoffending within 2 years
- *Loomis v State of Wisconsin*
  - Loomis charged for driving a stolen car during a drive-by shooting
  - Compas assessment: high risk score
  - Sentence: six years in prison

> "I am ruling out probation because of the seriousness of the crime and because your history, your history on supervision, and the risk assessment tools… suggest that you're extremely high risk to re-offend."

Case study: Compas

- On appeal, Loomis argued:
  - Proprietary nature of Compas prevents him from challenging its accuracy (how risk scores are determined not disclosed)
  - Risk scores take gender into account, violating a defendant's due process right not to be sentenced on the basis of gender
- Decision of the Wisconsin Supreme Court
  - Sentence affirmed
  - Loomis can verify his answers upon which the risk score is based.
  - Incorporating gender as a factor promotes accuracy
  - Limitations and cautions:
    - Risk scores may not be used to determine the severity of the sentence
    - Risk scores may not be used as the determinative factor in probation decisions

Some thoughts

- AI will not replace judges or lawyers any time soon (or ever)
- AI can improve efficiency and consistency of court decisions
- Transparency of AI systems
- Regular evaluations