When can you use AI with ABM?

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Purpose of paper/talk

1. To look at the different purposes for which AI entities/algorithms have been developed
2. To briefly summarize their current success at each of these
3. To critique the assumption that because an AI is good for one purpose it is good for another
4. Then look at a brainstormed list of possible uses of AI with ABM
5. Then see what is necessary in terms of quality of achievement at each AI purpose for these uses of AI with ABM

Limitations of talk

- I will be primarily talking about LLMs as they are the most used/applied AI technique but will also mention other Machine Learning approaches
- The field of AI/ML is changing very fast so some of the assessments and summaries in this talk may date quickly
- Although I brainstormed possible uses of AI with ABM, I might have missed some
- Some of the envisaged uses of AI with ABM are theoretical – I have not come across any actual instances of them yet

ABM and AI have a lot in common…

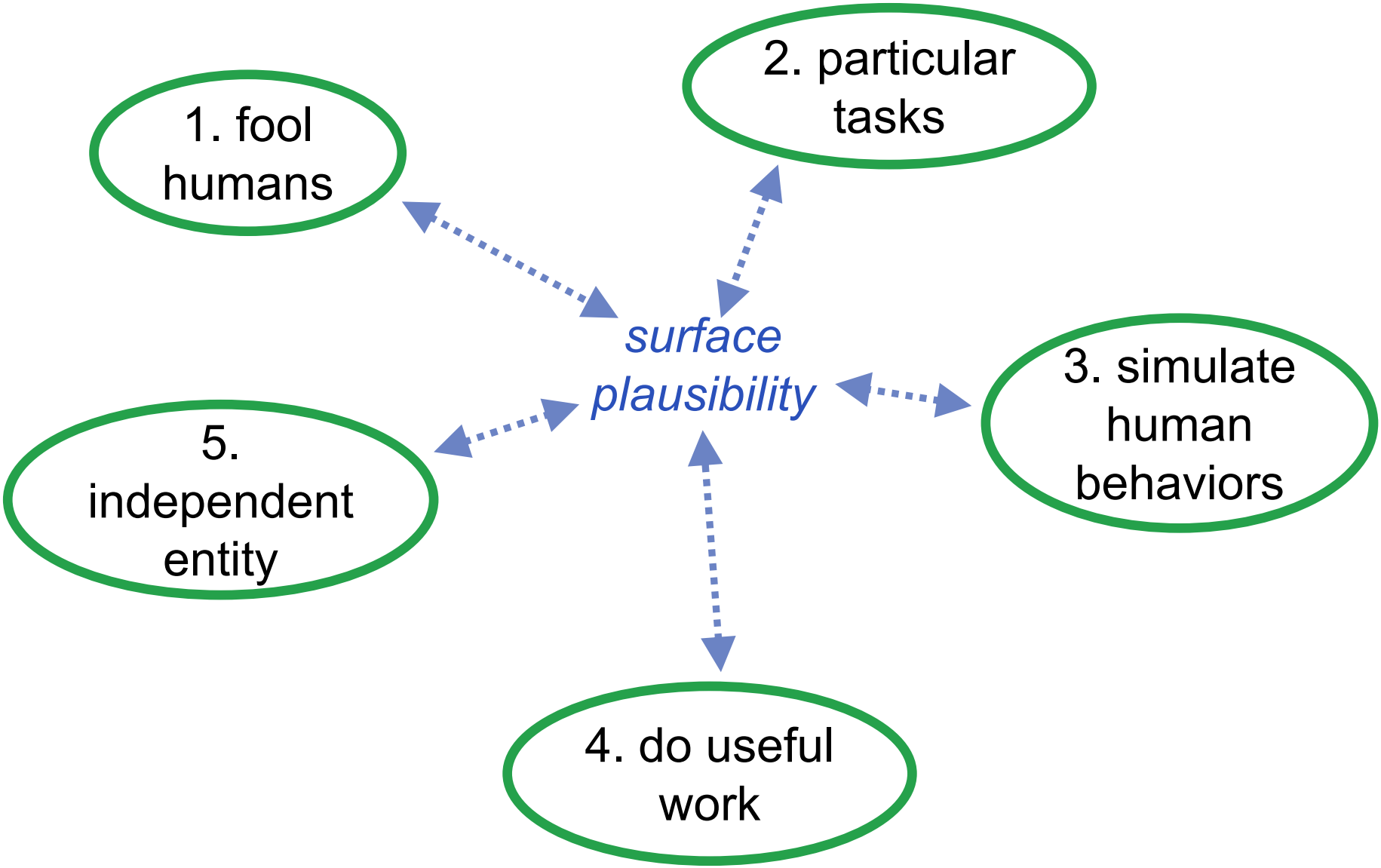
…they are both plagued by their surface plausibility

…where, *at best*, some calibration is done but *only rarely* any independent validation

Different purposes for AI

1. To fool humans into thinking AIs are human
2. To do particular tasks as well as humans
3. To simulate human behaviour
4. To do useful work for humans
5. To make decisions as a successfully independent entity

Just because an AI is good at one does not mean it is good for another!



Uses of AI with ABM (part 1)

a) Prediction of unknown data

b) Explanation of known data

c) To assess the ability of LLMs to work with humans

d) To train AIs for teamwork with humans

e) To play parts in a game designed to inform an ABM

Uses of AI with ABM (part 2)

f) To illustrate how a group of interacting humans might behave

g) To program ABMs

h) To analyse complex formal data

i) To analyse qualitative data

What is necessary in terms of establishing that AI purposes succeed for uses with ABM?

	Fool humans	Particular tasks	Simulate human behaviour	Useful work	Make decisions for self
Prediction		✓	✓		?
Explanation			✓		?
Test working with humans		✓	✓	✓	✓
Train AI's for teamwork			✓	✓	✓
Play parts in experiment	✓		✓		✓
Illustrate human behaviour	✓		✓		✓
Help code ABMs		✓		✓	
Analyse formal data		✓		✓	
Analyse qualitative data		✓	✓	✓	

Conclusions (part 1)

- AI is developing quickly, so some of these assessments might date, but the general arguments should still hold.
- So far, AI systems have managed to:
  - fool humans but only in restricted circumstances,
  - do a range of tasks as well as or better than humans,
  - do some useful work for humans
- So far, they have not been very good at:
  - simulating human behaviour
  - or making decisions as an independent entity.

Conclusions (part 2)

- AI systems differ depending on the task they are developed for.
- If one wants to use AI for some purpose then one needs to match the kind of AI system to your purpose.
- Currently, LLMs do not mimic human behaviour beyond a level of vague plausibility.
- If one is going to rely on LLMs to mimic human behaviour, then this needs to be checked. Narrowing down behaviour using “prompt engineering” is insufficient.
- There are uses of LLMs to aid in simulation tasks, but they are currently not that of replacing agents that represent humans with LLMs in any simple manner.

The End!

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These slides are at: http://cfpm.org/slides

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