Modelling and Influencing the AI Bidding War: A Research Agenda

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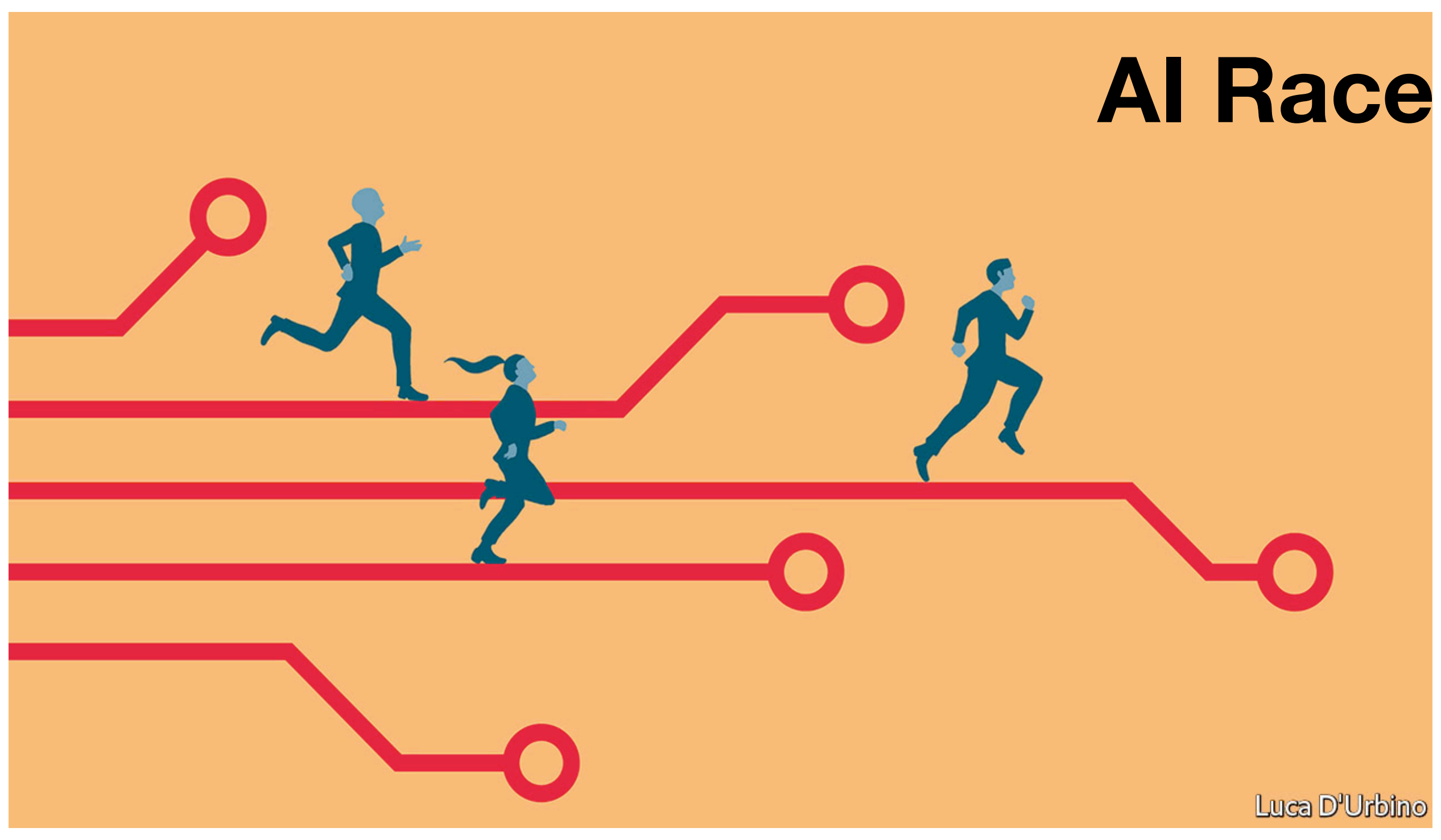
- ◆ A race for technological supremacy could lead to serious negative consequences (e.g. unsafe extra speedy development).
- ◆ Little attention has been given to understanding the dynamics and emergent behaviours arising from an AI race.
- ◆ We use Evolutionary Game Theory (**EGT**) to build models of competition and cooperation among AI development teams.
- ◆ Propose research agenda for **modelling** the AI race to understand its dynamics and how to influence it in a beneficial way.

AI Race Modelling Research Agenda



What are the key factors influencing the AI Race?
1) Openness
2) Risk perception
3) Inequalities (resources, capabilities, etc)
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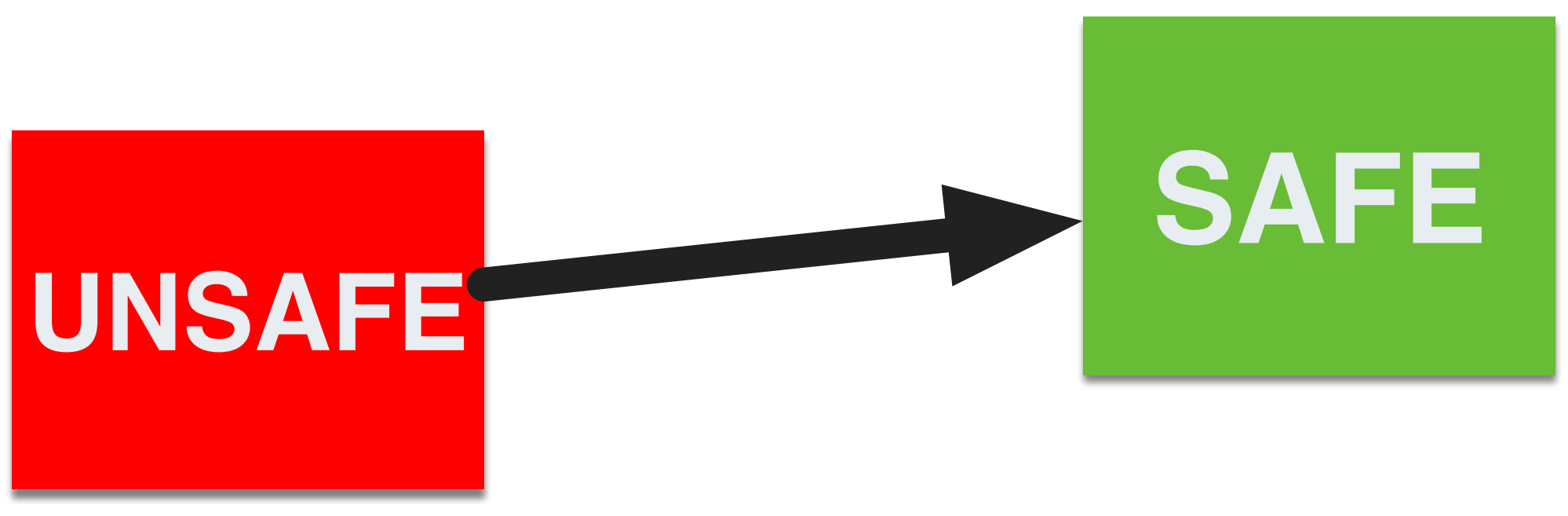
How incentives, viz. peer vs institutional, negative vs positive, and their combinations, can be used to ensure safety compliance?



AI Safety Agreement

EGT dynamical modelling of **agreements** & **incentives**

Two-team AI Race Models (preliminary)

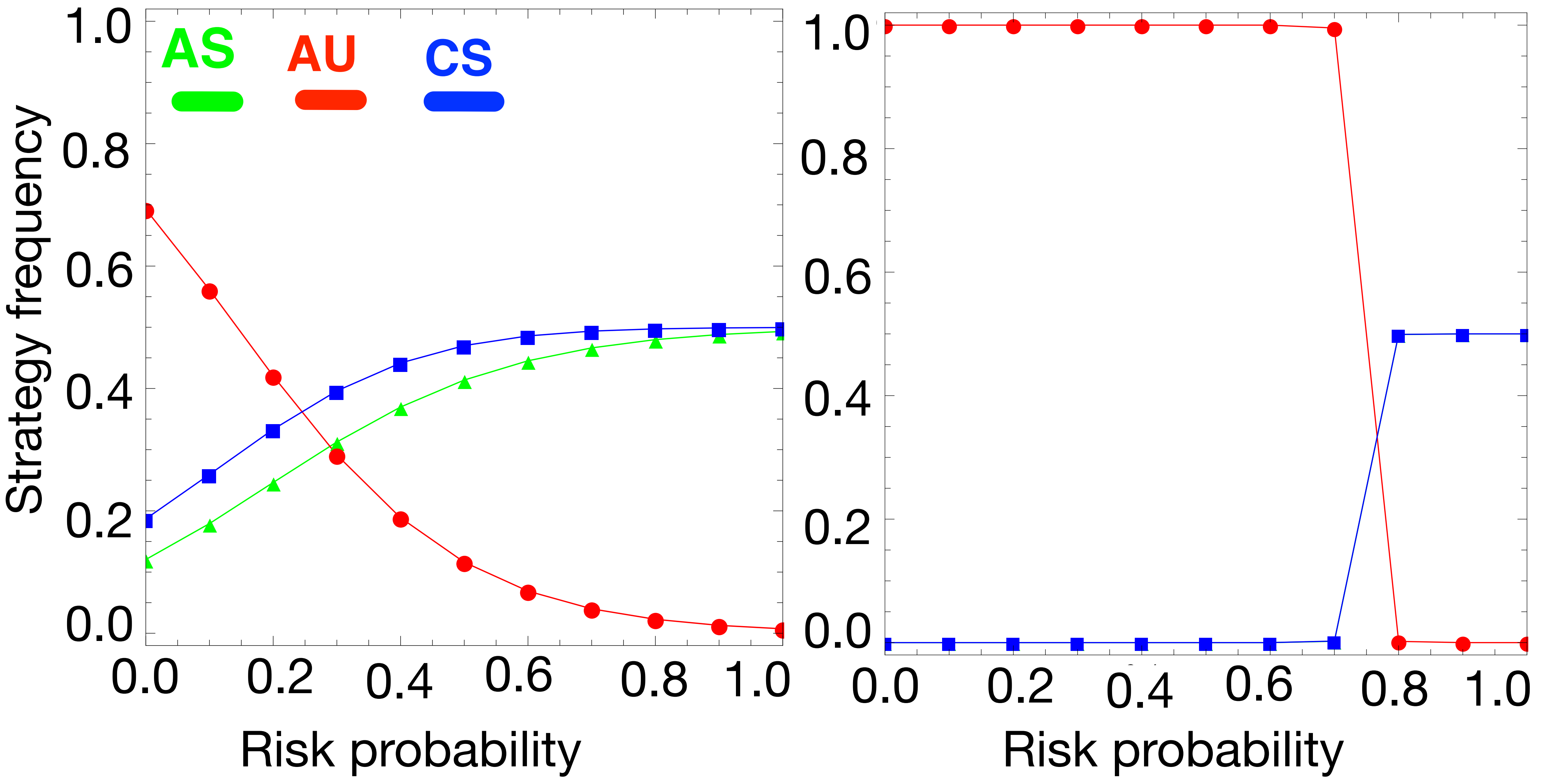
AI Race as a repeated game with two options SAFE and UNSAFE in each round.

Playing SAFE is more costly and takes more time than playing UNSAFE.

We consider a well-mixed population of players adopting one of three strategies
1) AS: always plays SAFE
2) AU: always plays UNSAFE
3) CS: conditionally playing SAFE

When benefit from winning the race is large, Always Unsafe (AU) dominates population

Race Winning benefit: SMALL **Race Winning benefit: LARGE**



NEXT STEPS

◆ Incorporate key factors into the models (group size, openness, inequalities, etc)
Incentives for promoting safety behaviour and agreement compliance (peer vs institutional, rewards vs punishment)

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