Question\_1: When computer science meets economics: Who do you truly want to become? Pick one of your favorite Nobel Prize winners (<https://www.nobelprize.org/>) and Turing Award winners (<https://amturing.acm.org/>). How do you want to contribute to the intersection of the two north stars to advance human civilizations?

My most impressive Nobel Prize winner is Claudia Goldin, who won the Nobel Prize for Economics in 2023. My favorite Turing Prize winner is Jack Dongarra, who won the Turing Prize in 2021. They are two people that I genuinely aspire to become. The reasons for my admiration for Claudia Goldin are manifold. I greatly admire her ability to leverage her expertise in her gender, women, to delve deeper into the issues of underestimated women's productivity.

Similarly, Jack Dongarra's groundbreaking work in fast computing, mainly through advancements in matrix computations, has profoundly impacted the field of computer science. His contributions have significantly increased computing speeds and efficiency, paving the way for breaking boundaries of computer development where computing power is harnessed to its fullest potential.

I aspire to emulate Goldin and Dongarra by contributing to this intersection. I am particularly interested in investigating innovative ways of fast-data transportation for remote, high-computing, burdened working.

By enabling remote, high-computing, burdened working, especially for women who are often disproportionately burdened by home caring responsibilities, the ability to work efficiently and effectively from anywhere can level the playing field and create opportunities for individuals whom geographical or logistical constraints may otherwise limit. Moreover, using fast computing can realize computation work done in labs with giant calculators nowadays. This will expand the scope of remote working variations, potentially increasing women's working opportunities.

In conclusion, Claudia Goldin and Jack Dongarra inspire my vision of contributing to high computing implemented for remote work, which can provide more working opportunities for women burdened by caring responsibilities.

**CS&Econ for a Better Future**: How do you perceive the synergy between computer science and economics as a catalyst for steering innovation toward a brighter future? Please present a foundational assertion, followed by multiple specific instances that support your claim, including a reference to a topic discussed at the colloquium on Friday, March 22.

Computer science and economics are interconnected: economics provides theoretical guidance based on people's demands, while computers approach these ideas through better algorithms, etc. As an example, for the extinguished guest Ming Wu at Friday lectures, the technology of blockchain is invented based on the needs of transparency transactions, which increases people's trust and security, while its decentralization enables marginalized computing to prevent user privacy leaking. Based on these concerns, blockchain was realized through computation. Meanwhile, Ming Wu also takes advantage of the current situation in China, which has an unfriendly blockchain environment. Thus, he opened a legalized blockchain company-Conflux to take the initiative of blockchain in China. Meanwhile, many economics theories were perfectly implemented with the help of machine learning. Economic theory emphasizes the importance of information and market efficiency. Traders utilize data analysis to interpret market trends, identify trading opportunities, and assess the impact of economic indicators on asset prices. For instance, analyzing historical price movements and volume data can reveal patterns that align with economic theories, such as supply and demand dynamics, market sentiment, and price discovery mechanisms.

Machine learning, on the other hand, integrates economic theories related to predictive modelling, risk assessment, and decision-making under uncertainty. Machine learning algorithms are trained on historical market data to learn patterns and relationships, enabling traders to forecast future price movements, estimate risk exposure, and optimize trading strategies. Economic theories such as efficient market hypothesis, behavioural finance, and risk-return tradeoffs inform the design and evaluation of machine learning models used in algorithmic trading.

**Beyond CS & Econ**: How are aspects of human nature, like bounded rationality and pioneering technologies, such as generative AI, reshaping the dynamics between humans and AI agents in strategic contexts? Additionally, how might this interplay be perceived and conceptualized distinctively from current models? Address this inquiry by drawing upon the literature covered in our lectures and supplementary scholarly works, ensuring that in-text citations and a comprehensive bibliography are included.

The interplay between humans and AI agents in strategic contexts is characterized by a blend of similarities and distinctions in rationality. While AI agents can simulate human-like thinking to a certain extent, their "imperfect" irrationality in specific topics or frames distinguishes them from humans. This evolving landscape calls for a nuanced understanding that integrates insights from behavioural economics, game theory, and AI research, recognizing both the potential and limitations of AI agents in strategic decision-making scenarios.

Research by Fan et al. (2023) highlights disparities between AI behaviour and human behaviour in the context of game theory. While AI agents may demonstrate basic rational abilities in some games, they often struggle with uncommon preferences, refining beliefs, and autonomously following player behaviour. Nonetheless, they can exhibit human-like performance in specific scenarios, suggesting a nuanced understanding of rationality beyond traditional frameworks. This indicates that AI agents can simulate human thought processes and make rational decisions to a certain extent.

Furthermore, Chen et al. (2023) examine the economic rationality of current GPT models. Their findings suggest that GPT's decisions across various domains often display a high level of rationality, sometimes even surpassing human subjects in experiments. However, these rationality scores are sensitive to contextual factors such as language frames, indicating that AI agents may exhibit rationality differently based on the decision-making context. This variability underscores the complexity of AI decision-making and its interaction with human environments.

These examples demonstrate that while AI agents can simulate human-like thinking, they still exhibit irrationality in specific topics or frames. Therefore, while rationality reveals similarities between humans and AI agents, the presence of "imperfect" irrationality distinguishes them. This evolving interplay between humans and AI agents in strategic contexts calls for a nuanced understanding beyond traditional models, incorporating insights from behavioural economics, game theory, and AI research.