Key Clashes
- Developments: more harm than good?
- Are they developing too fast? Are they considering ethical ramifications?
- Are regulations in S/T justified?
- Should science be about learning more or about how it can serve and meet human needs?

ST yipee ✓

Argument	Evidence	Explanation	Evaluation
Overcome human physical weakness	- Artificial insemination (Sperm is collected, either from the husband or a donor, and placed artificially into a women's uterus): 2% of babies born in the US are from IVF - Modern medicines can help treat illnesses that would have been death sentences previously: High blood pressure can help relax blood vessels to prevent hbp like Zestril , anti-depressants like Zoloft	- Can help infertile couples have children and participate in the joy of having children/countries with severe population replacement challenges to supplement themselves/Couples from less traditional structures can get children as well - Instead of medications that were largely ineffective that caused fatigue and insomnia like Reserpine (hbp) and just being dismissed as mania (depression), there are actual ways to mitigate illnesses we face now	- Tantamount to playing God/given drugs to induce ovulation so may risk the women/may risk the increased popularity of designer babies or donor siblings - Success in this area may be seen as a panacea for life's excess, making people more complacent (use meds instead of make lifestyle changes)
Convenience is provided by the advent of ST	- Robotics: Advent of "robotic waiters" from Chinese startup Pudu Robotics are prevalent in Haidilaos all around the world - You can also use other evid like the phones and stuff but i thought this was funnier ^^	- Reliably meet food wait time expectations (busy restaurants)/carry 66 pounds (10 times more than a human waiter), cover 1.2m/s	- Less of a burden on human waiters, less stress and can manage more important service needs rather than all the simple things
ST provides us	- Military buildup can	- Singapore:: Production	- Countries that are very

better protection than we have ever had before	protect the sovereignty of a nation in politically fragile situations: - Tech originally to protect us can be used for more everyday things: Global Positioning	of F-35 fighter jets, Next Gen Unmanned Aerial Vehicles, Maritime Security Unmanned Surface Vessels	small can use technological prowess in order to protect themselves against larger countries in case of an attack
ST allows us to solve global problems	- Genetically modified food: great significance to the world's starving population, helpful when population is growing largely - Vaccination: Can innoculate large groups of people and protect against deadly diseases	- GM rice called BT rice contains a gene that allows it to be resistant to various pests = increasing yield, profit - Polio is highly contagious, wrecks your nervous system = no. of cases dropped by 99.99% since the establishment of the 1988 Global Polio Eradication Intiative	- Allows for better food that can be better for producers (cheaper bc less pesticides, profit) and the consumers (more supply, more benefits if GM good for health) but concerns arise about health effects and its change to the environment - Vaccines good but not everyone likes vaccines
ST has allowed us to improve communications/close the distance	- Social Media: tech advances that transcend borders and redefine how we communicate - Transport Systems: Faster travel, more people transported, interconnectedness	- Whatsapp, Discord, Telegram, Microsoft Teams (free messaging apps to communicate all over the world), Instagram, Twitter, Tiktok (Interactive SM platforms that allow people to unite over geographical boundaries over shared interests) - Japanese Shinkansen, Planes being cheaper than ever	- Friendships can now be forged overseas, increases flexibility for employees (think families, mothers), connect overseas countries // exacerbate differences and fights online, online SMs bad

ST bad!!! ★

Argument	Evidence	Explanation	Evaluation
Playing God	Cloning: Nazi party conceptualised	Cloning allows humans to play	It has decent like motivations

	cloning Aryan superhumans, eliminating individuals with traits they didn't like (Eugenics), Hwang Woo Suk's 2005 research into cloning had him pressuring his research workers to provide eggs, National Bioethics Advisory Commision has laws that ban reproductive cloning in the USA	God -> lead to eugenics (artificial manipulation and control of the characteristics of people), the research puts actual humans now at risk to protect/help humans in the future, devalues life and turns the process of a reproduction into a mechanised one	(to cure genetic diseases, longer lives) but there are definitely ways where it can be discriminatory and bad because humans are bad :/
Disregard for the sanctity of life	War weapons: Nuclear weaponry (Countries with weapons: Russia, US, China, France, UK, Pakistan, India, Israel, NK, estimated no. of deaths from 13-34 million people from blast + heat + fallout of nuclear weapons), Chemical warfare (White phosphorus used in the war in the Middle East, burning humans, Agent Orange in the VVV)	weapons like this have raised ethical and moral concerns, especially with how indiscriminate these weapons are, destroying both important targets (military, key infrastructure) and having long-term and unintended consequences that cause more harm than benefit (civilian casualties, nuclear fallout)	The same technological advancements that have led to medical breakthroughs, energy innovations have also led to weapons of mass destruction = bad, can also pose global security risks and fears = make it worse between global powers
Addiction	- SM: TikTok having limits on how much you can scroll on your FYP, estimated 210 million people suffer from addiction to SM/internet (University of Michigan study) - Video games: 'Reset Summer Camp' in USA as a camp to help teens reduce their screen time to reasonable levels, up to 4% of gamers are currently addicted	- SM: can contribute to mental health issues (anxiety, depression, low-self esteem) due to constant comparisons, risk of polarisation and misplacing of priorities (celebrities >> actual issues, see Met Gala v Palestine) - VG: Bad for physical health, social isolation (see Hikikomori movement in Japan)	Though these outlets can be considered fun, growing trends over the years (esp during the pandemic) have shown that there is an increase in a reliance in these things and escape reality = because they do this for an emotional reason rather than just for pleasure, there's a higher risk of addiction
Human redundancy	- AI : Marvel using AI generated images for shows (Loki, Secret Invasion), AI used by a website Dudesy bring back dead stand up comedian George Carlin for a comedy special (George Carlin: I'm Glad I'm Dead)	- Creative jobs are being supplanted/replaced by Artificial Intelligence	Without any decent intervention/laws put in place by any government, AI will continue to usurp more creative jobs
Unlevel playing field (Class divide)	First world countries have access to the best technologies, while third	This means that there is an inequitable distribution of	inequity bad (sorry)

	world and developing countries do not have that: 2022, 2.7 billion people, representing a third of the world, do not have access to the internet	technology, and the benefits are largely concentrated only in the	

Applications of ST

Artificial Intelligence (AI) ᶻ z

- Recent trend: ubiquity of generative AI (DALL-E, MIdjourney, ChatGPT)
- Prevent negative impacts by (Way forward): Acknowledge the dual use of AI + engineers and scientists need to work with policy makers to come up with a code of ethics + policy frameworks have to be able to adapt
- <u>Straits Times (2023)</u>: ChatGPT performed bad in solving arithmetic problems (scoring 21/100 in the 2022 Mathematics PSLE paper), performed worse in English Comprehension, notably struggling in understanding nuance and making inferences (10/20 in 2022 English PSLE paper)
- <u>McKinsey and Company (2022)</u>: AI's computers can perform elementary arithmetic operations at a speed of 10 billion operations per second. Meanwhile, the highest frequency of brain neuronal firing is about 1000 spikes per second- 10 million times slower than a compute
- Better to see the two as complementary agents: AI to aid in our lower-skilled duties, humans give the more higher-skilled tasks = our old roles got replaced by AI but humans have simply moved on to a new role that serves us better.

Pros	Cons
Saves Human Costs - (2017) MIT review: '1 in 5 companies reported that they had incorporated AI in some offerings or processes' = AI could deliver $13 trillion in additional global economic activity by 2030	Displacement of workers - 47% of total US employment is at risk from automation - Especially with their usage in jobs that used to be considered safe (Graphic design, law, scriptwriting) now may compete w us in cognitive skills ('capability replacement')
Saves times - Numerous companies in financial industry are using AI in their decision making (projects and assess loan risk, improve loan underwriting) - Lawyers using AI to compliment the pain-staking research they usually have to do (Harvey AI, Paxton) with platforms that cover vast legal databases and case libraries (JP Morgan: used machine learning to interpret agreements and contracts in record time. What used to take lawyers and loan officers 360000 hours a year to sift through can be processed in seconds)	But actually, it could be really bad for people if we prioritise saving time above all else (Human costs) - many Amazon employees are so afraid of being replaced by AI that they do not take bathroom breaks so that they won't fall behind these robots who require none - Today Online (2022): Singapore's therapy chatbot for stressed and overworked MOE teachers 'drew flak for being unhelpful, even aggravating, to the users who seek mental support in

Saves lives	Yeah but also...
- Nigeria: using machine learning to detect birth asphyxia (third highest cause of under-five mortality in Africa) - Drones can be used to map out floods and potential safe sites (Gambia + UNESCO, 2023) - AI can be used to predict earthquakes (CS: Texas, 2023 where pilot testing was carried out	- Extreme strength in saving people = extreme strength people can use to screw with people - See: Taylor Swift AI-generated photos: putting the singer in compromising positions that were proliferated on X - Weaponizing of AI: 'drone swarms' (put small explosives on them and use self-driving tech to carry out untraceable assassinations as 'slaughterbots')

Market for Personal Data x Corporate Responsibility ᶻ z

Statistics	Regulation
- Oracle (Computer software company): sell data on more than 300m people globally, 30 000 data attributes per individual (covering 'over 80 percent of the entire US internet population at your fingertips') = Personal data is being sold, commodified and exploited by large companies to manipulate you - Cambridge Analytica scandal (2010s): In the 2010s, personal data belonging to millions of Facebook users was collected without their consent by British consulting firm Cambridge Analytica, predominantly to be used for political advertising, where eventually data was collected on over 80.7 million users	- No all-encompassing law currently exists in the USA to manage privacy in terms of companies collecting/storing/sharing consumer data - 2018, EU: General Data Protection Regulation (GDPR) to modernise laws that protect the personal information of individuals + boosting the rights of individuals + more control over their information

Changing Workplace Trends ᶻ z

- World Economic Forum prediction: AI + automation = creation of 97 million new jobs by 2025
- Initially, AI meant to automate repetitive elements (lawyers doing research, doctor analysing medical records, store managers to aid inventory plannings)
- MIT + Boston University economists: robots could replace 2 million more employees in manufacturing alone by 2025
- Resumes (2018): 67% of hiring managers said artificial intelligence made their work easier to scan resumes (Good bc its faster, bad because AI may have programmed biases that affect the fairness of the hiring process)