Ethics Workshop

March 13th, 2025

As you sit down and settle in...

- Would you rather invest more in electric vehicles or public transportation?

Discuss with the people around you!

Electric Vehicles and Public Transportation

Background

- About 20% of global greenhouse gas emissions come from transportation
- 2 main efforts to reform the transportation industry
  - Investing in public transportation
  - Investing in electric vehicles

	Public Transportation		Electric Vehicles	
	Pros	Cons	Pros	Cons
Environment	More environmentally friendly than gas vehicles	Most buses run on fossil fuels	More environmentally friendly than gas vehicles	• Environmental impacts of lithium mining and disposal of batteries [1] • Cobalt mining for lithium-ion batteries linked to modern-day slavery in the DRC [2]
Infrastructure /Cost	Cost-effective	• Inflexible routes, investment in infrastructure • Limited accessibility for people with disabilities, investment in infrastructure	Government incentives for buying EVs	• Investment in infrastructure (charging) • Affordability, average person in US cannot afford an EV
Space		Can get crowded, limited room for luggage, groceries, etc	Individual travel	

Guiding Questions for Discussion

- Is there a practical way to implement public transportation on a national scale?
  - Think about travel paths from rural to urban areas
  - Think about congestion during peak hours
  - What would be a first step? Is there a city or country to look at first?
- Is there a viable future in individual passenger transportation?
- Are the problems with lithium mining a reason to stop investing in electric vehicles?
  - Should more effort be put into finding alternatives to lithium-ion batteries
- What do you think the future of the transportation is?

Generative AI and Environmental Impacts

Background

- Environmental impacts of generative AI
  - Water usage
    - Technology firms using water to run and cool these data centres potentially require water withdrawals of 4.2 to 6.6 billion cubic metres by 2027 [1]
      - By comparison, Google's data centres used over 21 million cubic meters of potable water in 2022 [2]
    - ChatGPT consumes about one bottle of water to write a 100-word email [1]

- Expenses related to generative AI
  - Investment into AI technology vs investment in solving climate crisis
  - COP 29 Agreement: Triple finance to developing countries, from the previous goal of USD 100 billion annually, to USD 300 billion annually by 2035 [3].
  - Estimates of how much money it would take to end global climate change range between $300 billion and $50 trillion over the next two decades [4].

Guiding Questions for Discussion

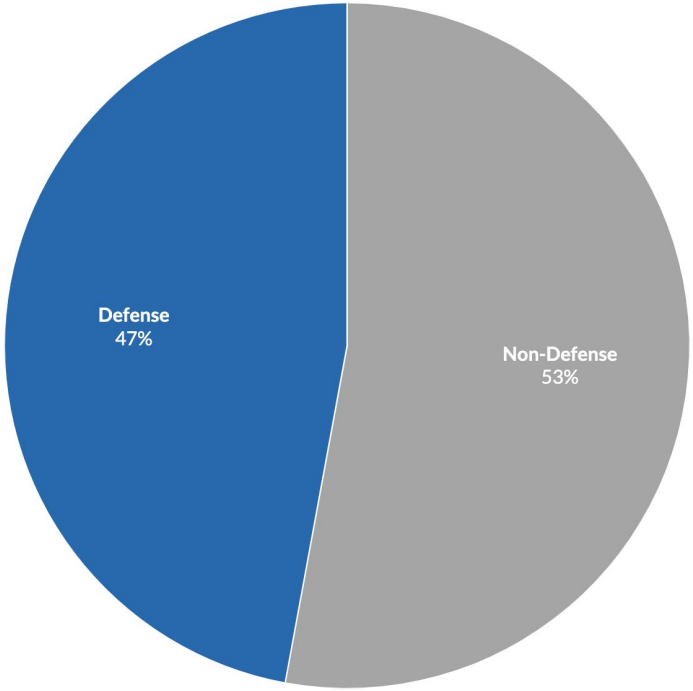
- How can the tech industry balance innovation with reducing AI's carbon footprint?
- Should governments mandate transparency about the environmental impact of AI systems (e.g., "carbon labels" for algorithms)?
- How should we as individuals be held accountable / can we be held accountable?
  - Should you be the one that turns ai off or should it be the default ?

Climate Post Discussion

- Who should be held accountable for the climate crisis?
  - Individual consumer
    - User of ChaptGPT
    - User of gas vehicles
  - Industry
    - Major polluters
    - Companies researching generative AI
  - Government

National Security and Defense

Background



Defense spending accounts for nearly half of total discretionary spending

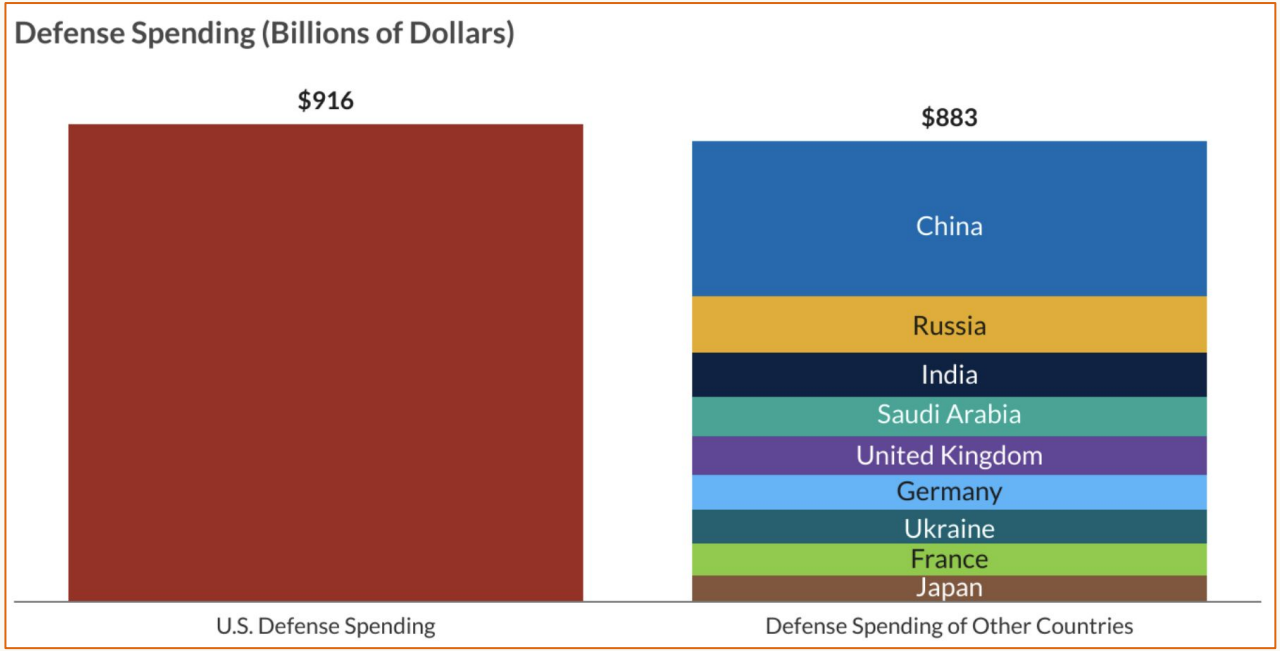
2024 Discretionary* Outlays: $1,815 Billion

Non defense includes: Transportation, Veteran's Benefits and Services, Health, Education, International Affairs, General Government, Administration of Justice, Natural Resources and Environment, Housing Assistance, General Science, Space and Technology, Community and Regional Development, and Training, Employment, and Social Services spending

* Discretionary Spending: Discretionary spending is money formally approved by Congress and the President during the appropriations process each year

[1]

Background



Defense Spending (Billions of Dollars) for the year 2023

The United States spends more on defense than the next 9 countries combined

[1]

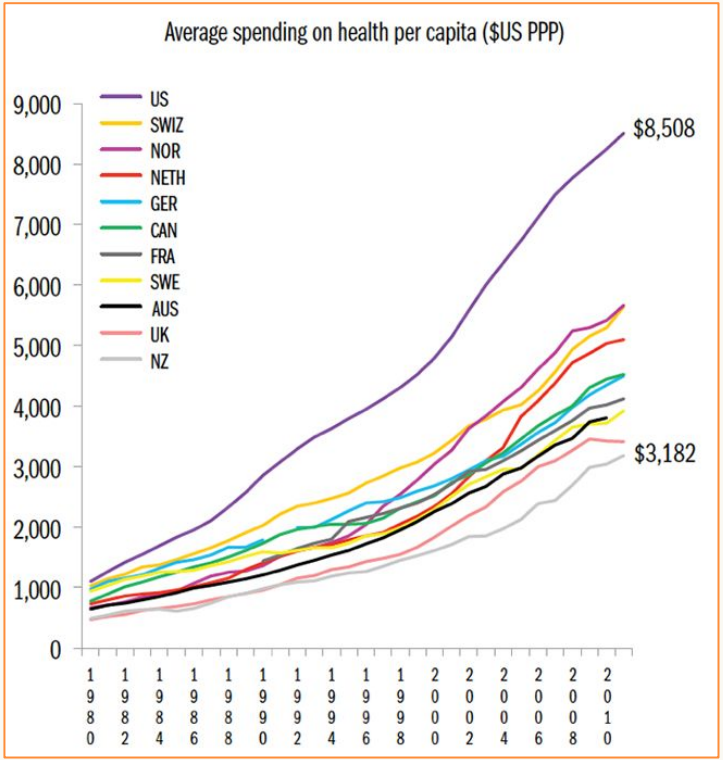
Guiding Questions for Discussion

- Would you feel comfortable working on a part/technology that has multiple applications?
  - Ex:
    - Drones for agriculture versus military spying and attacks
    - Guidance systems for satellites versus military drones
    - Robotics for labor assistance versus military applications
- What kind of weapons do you draw the line at?
- How do you feel about military ties to education?

Public Health and Specialized Medical Devices

	Public Health vs. Specialized Medical Devices	
	Public Health	Specialized Medical Devices
Scope and focus area examples	• Population-level and prevention-based • Vaccination programs and disease tracking	• Individual patient diagnosis and treatment • Pacemakers and robotic surgery tools
Stakeholders	• Governments and NGOs	• MedTech, healthcare providers, and regulatory bodies
Goals	• Reduce morbidity and mortality at scale and address social determinants of health	• Enhance outcomes and personalized healthcare
Challenges	• Cultural resistance and inequitable resource distribution	• High R&D and production costs, regulatory compliance, and accessibility gaps

Background



[1]

In 2024, the US was ranked

- Last amongst other developed countries* in access to care, care process, and health outcomes [2]
- Second to last in administrative efficiency and equity [2]

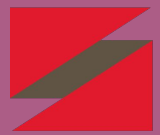
*"Developed countries" include: Australia, Canada, France, Germany, the Netherlands, New Zealand, Sweden, Switzerland, the UK, and the US

Guiding Questions for Discussion

- How do public health initiatives and specialized medical devices complement each other?
- In what ways do they compete for resources and attention in the healthcare sector?
- How can policies balance the focus between improving public health and investing in specialized medical devices?
    - Think about access health foods and preventative care
- What are the potential future trends in both public health and specialized medical devices?

forge

Feel free to keep discussing!



Northeastern University
Michael J. and Ann Sherman Center for Engineering Entrepreneurship Education