The Social Costs of AI: Updates

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Today's agenda

- Current Status
- Results
- Lessons Learned
- Next Steps

Current Status

Project status (last presentation)

- Build test computing infrastructure ✔
  - Setup energy measurement architecture ✔
  - Setup computing environment ✔
  - Run BERT model ⚙
- Build real computing infrastructure ❌
  - Get new computing hardware ❌
- Analyze energy data ❌

Run BERT model

- No proper hardware yet
  - Use existing infrastructure
- No proper software for model training
  - Find software to train BERT base
  - Realize our existing hardware is too old
- Will come back to this task ⚙

Build computing infrastructure

- Buy professional hardware system (Jetson AGX Xavier)
  - Delivered: 30. March 2022
  - Unsuccessful tests the very same day
- Realize there are problems with the system: 31. March 2022
  - Try to reflash the device until 9 p.m. of March, 31st
    - "Waiting" more than six hours (release payment)
  - Contact customer support by ticket system: 6. April 2022
- Return device: 3. June 2022

Build computing infrastructure (2)

- Return device: 3. June 2022
- Get repaired device back: 4. July 2022
  - Still broken: mouse and keyboard didn't work
  - Contact customer support again
- Return device: 25. August 2022
  - After giving a deadline: 31. August 2022
- Repaired device arrives: 2. September 2022
  - It kinda works! 🎉

Build computing infrastructure (Back-Up Plan)

- Existing hardware was too old
  - Specifically: GPU was too old
  - Decision to buy and use a RTX 3060
- Replace this component: 13. June 2022
  - Works perfectly! (since 17. June 2022)
- Build computing infrastructure ✔
- Run BERT model ✔

Run BERT model training

- Wikipedia
  - ≈ 1 billion words and symbols
  - Training time: 1 day
- BookCorpus
  - ≈ 11,000 books (read 10 books per month for 100 years)
  - ≈ 10 billion words and symbols
  - Training time: 6 days

Results

What can our AI model do?

Notebook example

Energy consumption

- Strubell et al. (2019)
  - 1,500 kWh
  - 2,500 km (driven by average car)
- AI Lab
  - 40 kWh
    - Much less energy consumption
    - Possibly because RTX 3060 was released at 2020-09-17
  - 70 km (driven by average car)

Whats Next?

Lessons Learned

- Always have a back-up plan (we did!)
- Be less patient in B2B contexts
  - Set deadlines after experiencing the *first* problem
  - *Be loud* until your problem has been solved
  - The bigger the company the faster and better their reaction

Thank you!

Questions?