**Cheating Charon – Storyline – Lightning Talk**

**Max 3 minutes**

**Situation:**

Predicting the consequences of our changing climate for public health is a crucial area where machine learning can assist policy makers. As the effects of man-made climate change are felt, excess deaths due to extreme temperatures and weather events are expected to rise.

* Climate change is a massive problem and will impact the world in a number of ways
* One key prediction is rising temperatures
  + Rising temperatures has immediate implications for mortality and deaths
* One key variable is emissions
  + The outcomes for public health under the two different scenarios could look very different
* Our project was about three things:
  + Predicting the consequences of climate change
  + Demonstrating the different outcomes between predicted emission scenarios
  + Demonstrating the difficulty of applying ML to this question

We applied our selected models to two separate, yet credible climate scenarios, further demonstrating the complexity of climate-change mitigation and adaptation for public health authorities and bodies.

**Complication:**

* **Data:**
  + Causes of death from Our World in Data
  + Global population from the World Bank
  + Temperature data from the EU Copernicus Climate Data Store
* **Models:**
* In sum, we used the following five models on our data sets:
  + Linear Regression
  + Decision Tree
  + Gaussian Process Regression
  + Gradient Boosting Regressor
  + Extreme Gradient Boosting Regressor
* **Tuning:**

???

* **Results:**
* Best performing model was:
  + Gradient Boosting Regressor
* Our model predicted a causal relationship between temperature and mortality.
* However, it didn’t recognize a difference between the emissions scenarios.
  + We need more data to make this work
  + Further tuning of models
  + And time lag built into models

**Conclusion:**

* We were able to make predictions about the outcomes of the different scenarios.
* We need more variables to see more variation in our predictions
* But at least we have a start and we’ve demonstrated the difficulty of applying machine learning to this complex public policy space.