The Antarctica has already experienced a 3°C rise in air temperature and is melting at an ever increasing pace. Yet there exists no daily high-resolution satellite imagery to monitor, understand, or publicize the melting processes in Antarctica. In our previous research, we have advanced the physical-consistency of generative adversarial networks (GANs) to synthesize trustworthy satellite imagery of future coastal floods. This UROP project will extend the method to temporal data and generate a trustworthy synthetic satellite product that visualizes melting Antarctic sea ice.

Preferred, but not necessary qualifications:

- Experience working with satellite data, e.g., Sen-1/2, Planet, MODIS
- Geospatial data processing, e.g., python rasterio, Google Earth Engine, ArcGIS, etc.
- General understanding of numerical methods for solving differential equations
- Cryospheric dynamics, e.g., ability to understand the MAR model
- Understanding of generative deep learning models, e.g., VAEs, GANs, normalizing flows, diffusion models
- Programming experience with machine learning libraries, e.g., pytorch, tensorflow
- Passion for climate issues
- Collaborative spirit

We strongly value an environment of inclusion, support, and collaboration and highly encourage students from historically excluded groups to apply. The research will be with our team at the Human Systems Laboratory, Dept. of AeroAstro, and Prof. Dava Newman. If you’re interested please feel free to email me until 09/17 with a CV and two paragraphs about your interest, experience, and long-term goals at lutjens [at] mit [dot] edu.

Thank you,

Björn Lütjens