

Introduction

Our Mission:

Our objective is to model the distance traveled by individuals to professional conferences in order to conduct emissions calculations for these conferences. With this location data, an optimal conference location can be chosen to minimize emissions caused by travel.

Our Process:

- 1. Scraped Society for Industrial and Applied Math (SIAM) conference programs to gather location data for the conference attendees, grouping by institution.
- 2. Found the geographical distance between these institutions and the conference location.
- 3. Assumed a method of travel based on this distance then calculated the carbon emissions of each institution.
- 4. Created a GUI to allow for users to calculate the carbon footprint of an individual trip.
- 5. Constructed a dashboard displaying the data we gathered.

Graphical User Interface

Emissions Calculator

Enter your travel locations:

From (e.g., New York)				
To (e.g., Paris)				
Calculate				

GUI Procedures

STEP 1:

Input fields for "From" and "To" locations

Emissions Calculator

Enter your travel locations:

Johns Hopkins University			
New York Times Square			
	Calculate		

STEP 2: Click 'Calculate' button with results showing off

Results

Travel Mode	Distance (miles)	Emissions (kg CO ₂)
Car	-	0.00
Train	170.74305308796409	11.44
Plane	-	0.00

Calculation Algorithms Behind GUI

Total Emissions: 11.44 kg CO

(1) Geocoding with Nominatim API:

• Converts location names (e.g., cities, addresses) into geographic coordinates (latitude and longitude) powered by OpenStreetMap for data

(2) Distance Calculation:

• Uses the Haversine formula to compute the great-circle distance between two points on the Earth's surface

(3) Emissions Calculation:

- Categorizes travel into 3 modes based on distance:
 - Car: Short distances (< 75 miles)
 - Train: Medium distances (75–200 miles)
 - Plane: Long distances (\geq 200 miles)

Greenhouse Gas Emission of Professional Conferences

Jackson Roloff, Emily Ward, Nora Zhang, Colin Harte, Alex Colletti, Joey Souverein, Taylor Liu

Interactive Dashboard





The figure above shows the distance traveled by each institution with an optimal location based on a database of cities that would be able to host an event of this size and reducing greenhouse gases.

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University Locations Sized by Number of Attendees

This figure shows a heat map for the number of attendees attending to SIAM CSE 2025 from each institution.



Our interactive dashboard allows the user to filter between several different SIAM conferences to view and analyze the data from each respective conference. Implementing filters for each institution, users are able to view the carbon footprint, total distance traveled, and number of attendees for each institution. This can allow institutions to better track their carbon footprint of faculty and work toward more sustainable business travel.



1. University Attendees Map 2. Emissions by University Map 3. Travel Distance to Conference

Conference Data

Our Dashboard — Visualizing the Impact

