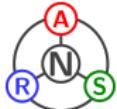


# Learning a spatial crash typology representation for analyzing and improving multimodal road safety in New England

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# Research agenda

Networks for Accessibility, Resilience and Sustainability (NARS) Lab

## Objective

- Advance sustainable and zero-emissions infrastructure systems
- Learn typology representations to guide decision-making
- Quantify and track emissions and energy metrics

## Methods

- Machine learning
- Optimization (and simulation)

## Current members (status; date joined):



Zhuo Han  
MS/PhD; Winter '20



Mohammed Abdalazeem  
MS/PhD; Winter '21



Mahsa Arabi  
PhD; Summer '21



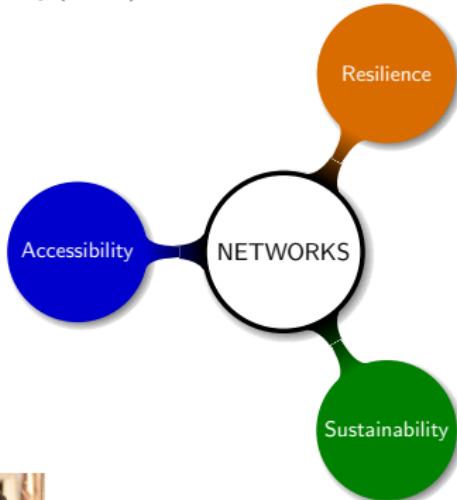
Peiyao Zhao  
PhD; Fall '23



Jimi Oke  
Fall '19

## Alumni

Atanas Apostolov (MS '24); Alexa Weinman (BS '23); Hichul Chung (BS '22); Vivian Rost-Nasshan (NSF REU '23).



# Project Overview

## Motivation

- 2 million people injured annually in car incidents across the US in 2013 (CDC)
- Crash fatalities have been on the rise since then: 10.5% from 2020 to 2021 (USDOT)
- *Roadway safety problem* affects travelers across all modes (in 2021, 13% of fatalities were pedestrians; 9% were motorcyclists) (FHWA)
- Key risk factors for crashes: speeding, alcohol, distracted driving, network conditions, congestion
- Gap: Yet to have a systematic understanding of key patterns and drivers of roadway crashes, controlling for topology, geography, mode, vehicle type, behavior, etc

## Timeline:

- Task 1: Collect and Integrate Data  
Task 2: Reduce Dimensionality and Cluster  
Task 3: Analyze Typology Patterns  
Task 4: Estimate Type Prediction Model  
Task 5: Publish Database, Dashboard and Model  
Task 6: Report, Summary and Presentation

