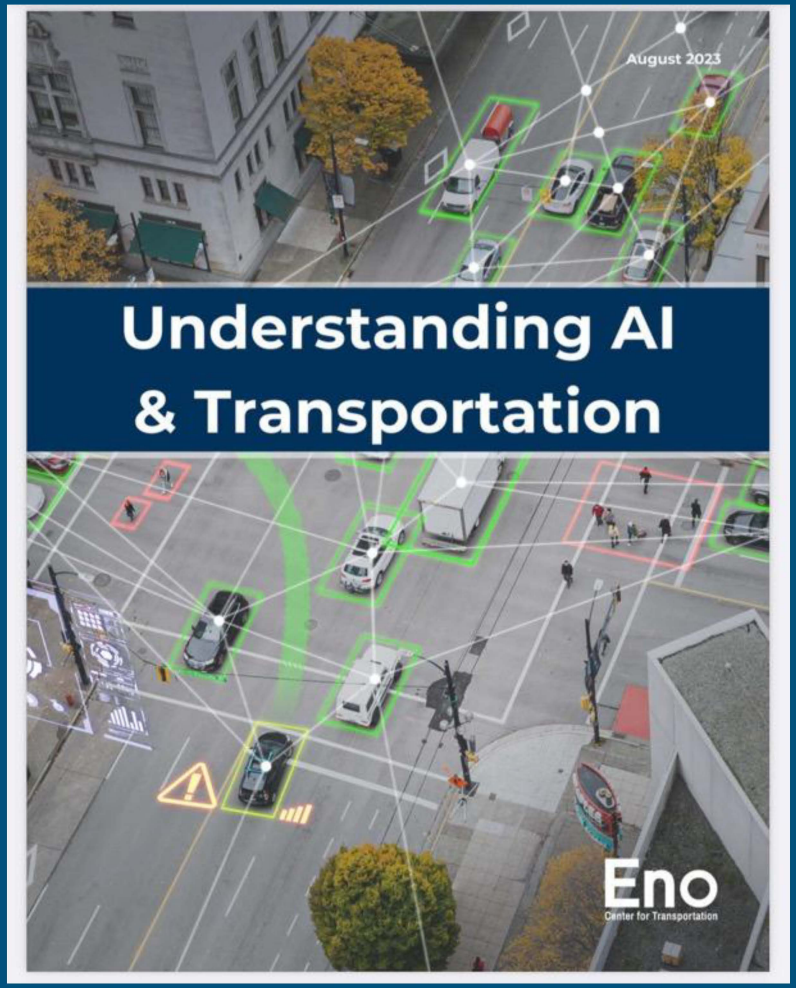
How AI Can Improve Transportation

Renee Autumn Ray
Director of Strategic Growth at Hayden AI
April 24, 2024

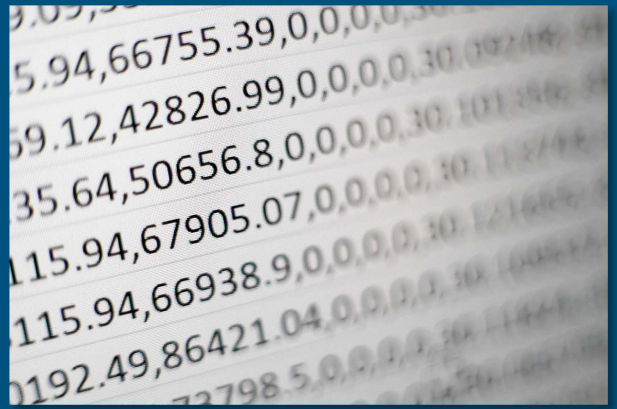
HaydenAI


August 2023
Understanding AI
& Transportation
Eno
Center for Transportation

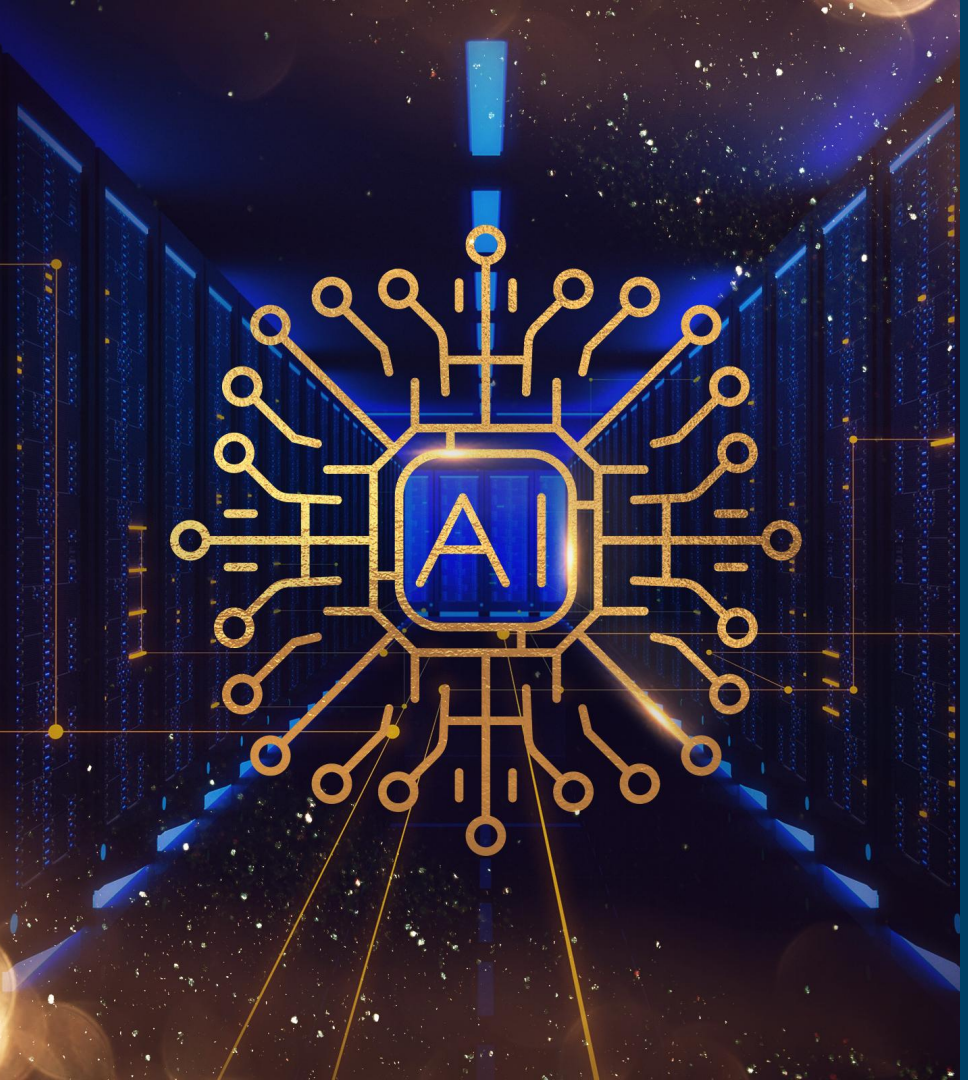
Artificial Intelligence:

an “interdisciplinary field, usually regarded as a branch of computer science, dealing with models and systems for the performance of functions generally associated with human intelligence, such as reasoning and learning.”

https://www.oecd-ilibrary.org/science-and-technology/venture-capital-investments-in-artificial-intelligence_f97beae7-en

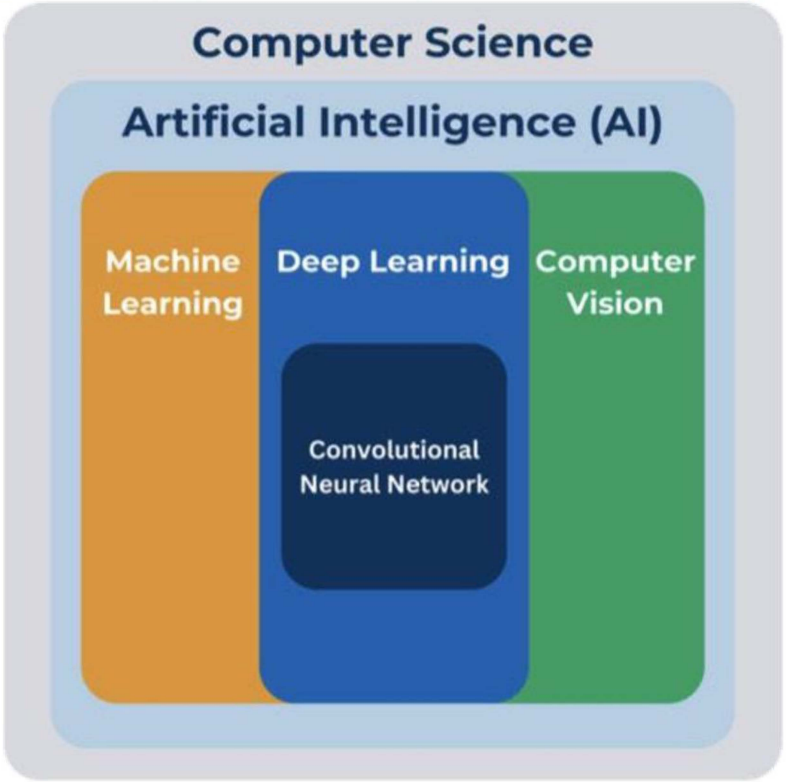

5.94,66755.39,0,0,0,0,
59.12,42826.99,0,0,0,0,30
35.64,50656.8,0,0,0,0,30
115.94,67905.07,0,0,0,0,30
115.94,66938.9,0,0,0,0,30
0192.49,86421.04,0,0,0,0,30

bed
you
to
pep
explore
miss
you
wet
bug
sorrow
torn
wings
ravish

- Autonomy
- Adaptivity

Figure 1: Diagram that visualizes AI methods and their relationship to each other



Beltzung, Benjamin, Marie Pele, Julien P. Renoult, and Cedric Sueur. "Deep learning for studying drawing behavior: A review," Front. Psychol., February 8, 2023.[13]

AI Applications in Transportation

Method	Transportation Applications
Computer vision	• Driver-assistance safety technology that uses object detection to interpret images from cameras on a vehicle.
Convolutional neural network	• Apply a convolutional neural network (CNN) to data sources such as satellite images, weather radar, and historic weather patterns to improve the accuracy of the location and intensity of weather patterns.
Deep learning	• Train ADAS or ADS systems to identify and classify objects such as traffic-control devices and to respond appropriately.
Machine learning	• Forecast demand for public micro transit vehicles by location, day, and time of day. • Create a usable outdoor wayfinding system to help people with disabilities navigate to exact transit pick up locations.
Natural language processing (NLP)	• Deploy a chatbot to deliver personalized wayfinding or route options.

AI Applications in Transportation

Method	Transportation Applications
Neural networks	• Identify various pieces of roadway infrastructure from images as a vehicle travels down a street.
Simultaneous localization and mapping (SLAM)	• Vehicles can use SLAM to identify and avoid objects in the roadway.
Supervised learning	• Use road, time, weather, and demographic data in a supervised learning model to create predictions for when and where crashes are likely to occur. • Improve ADAS capabilities by mapping images from a human driver's steering and throttle and adjusting the AI model to fit them more closely.
Unsupervised learning	• Train an AI model to take unlabeled geospatial data and identify the mode of transportation used so that location-based services could provide users with accurate, personalized information based on their location and how they are traveling.

What Should Leaders Know About AI?

- Force multiplier
- Support, don’t replace, human decision-making
- Same judgment for other procurement

Using AI Methods to Enhance Operations

Q&A