Big Data Analytics: Deceleration Characteristics of Older Drivers

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Objective and Background

- Chronic illness impacts driving.
- Clinicians must report driving concerns
- No agreed standardized tests for driving risk.
- In-car "black box" data - new data source
- Vehicles are typically shared by multiple drivers
- Drivers identification through signature
  - Distinguish drivers based on their habits

Methodology

- Candrive Dataset
  - In vehicle sensor data
  - Annual medical assessments
- Current focus drivers
  - Cognitive, Physical and General health stable over 1 year
  - Sole drivers of their vehicle
- Driving Preference Analysis
  - Frequency and length of Trips
  - Velocity and Velocity/posted limit
  - Time of day: Solar Cycle, Rush hour
  - Acceleration/Deceleration profiles
- Data Analytics

Acceleration Attributes	Mean Acceleration
	Minimum Acceleration
Velocity Attributes	Velocity change
	Final velocity for event
Duration Attributes	Duration of event
Time Attributes	Time of Day
	Date of event
	Solar cycle position
	Traffic level (Rush hour)
Road Network	Posted speed limit

Deceleration event features

The Data Set

Example Driver

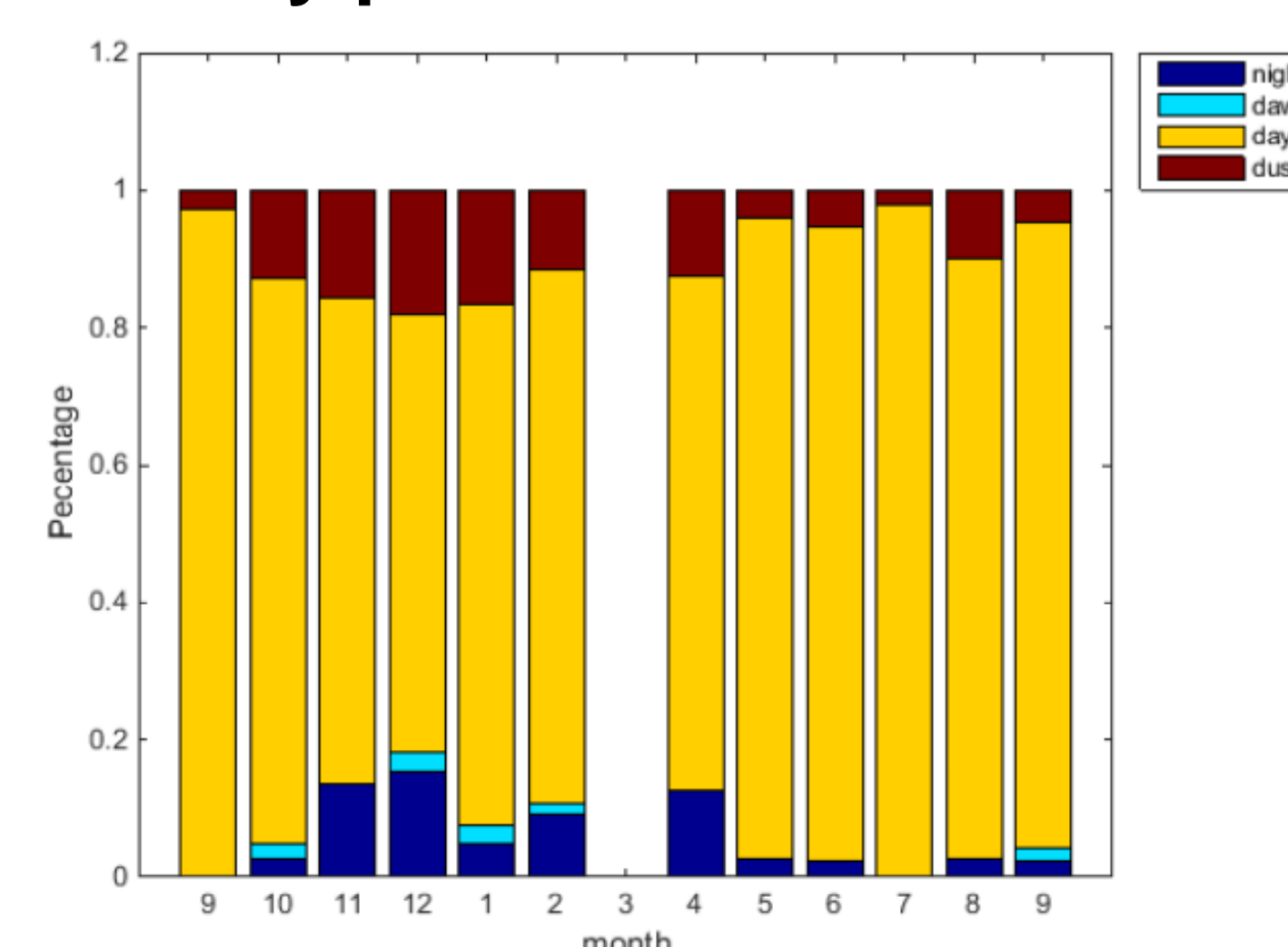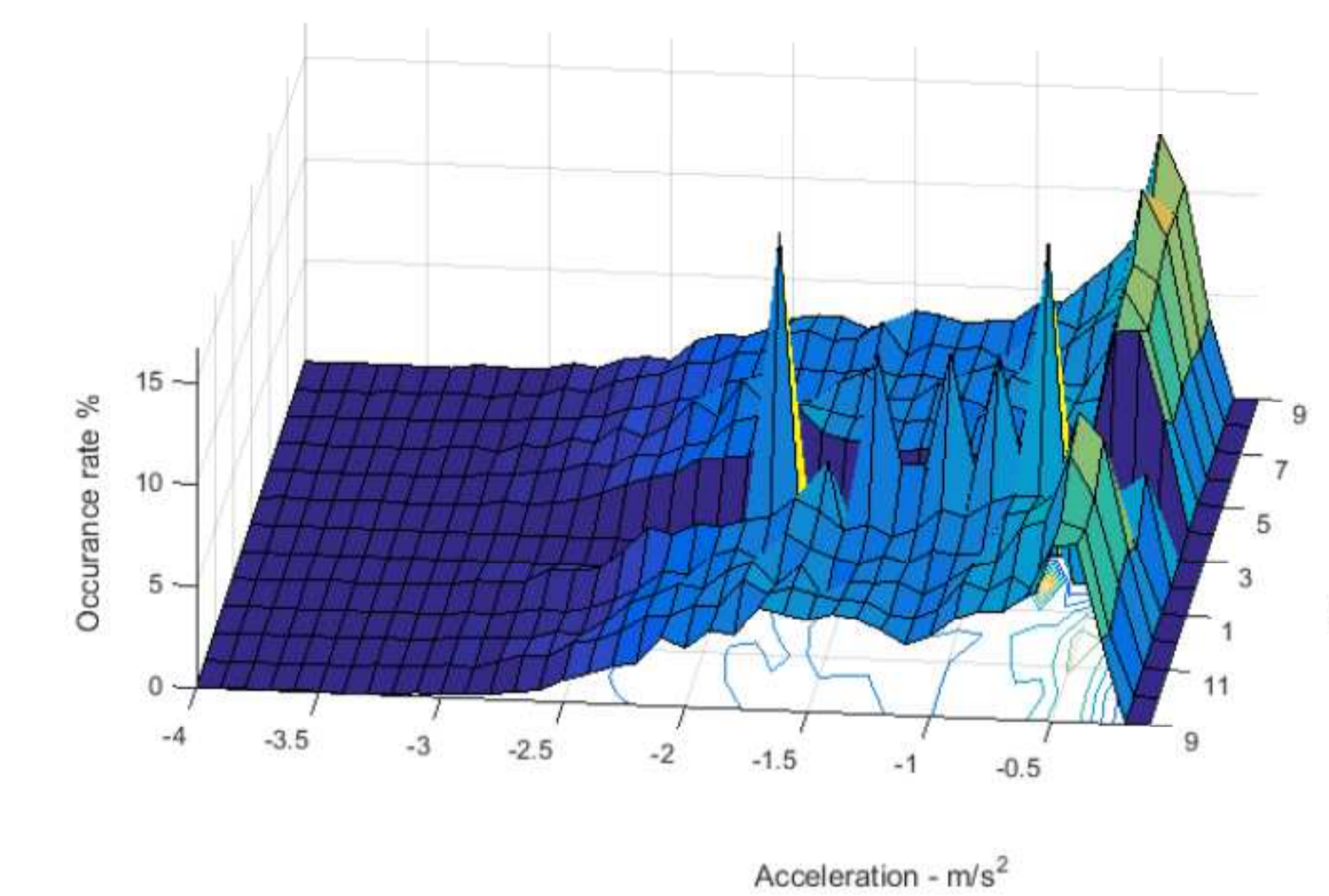| Demographic Data	Female 75 yrs at entry to study
Number of Trips	1562
Total Distance	13,425km
Analysis period	September to September (from entry into study)
Deceleration Events	24794

Driver Trip Frequency for 1 year
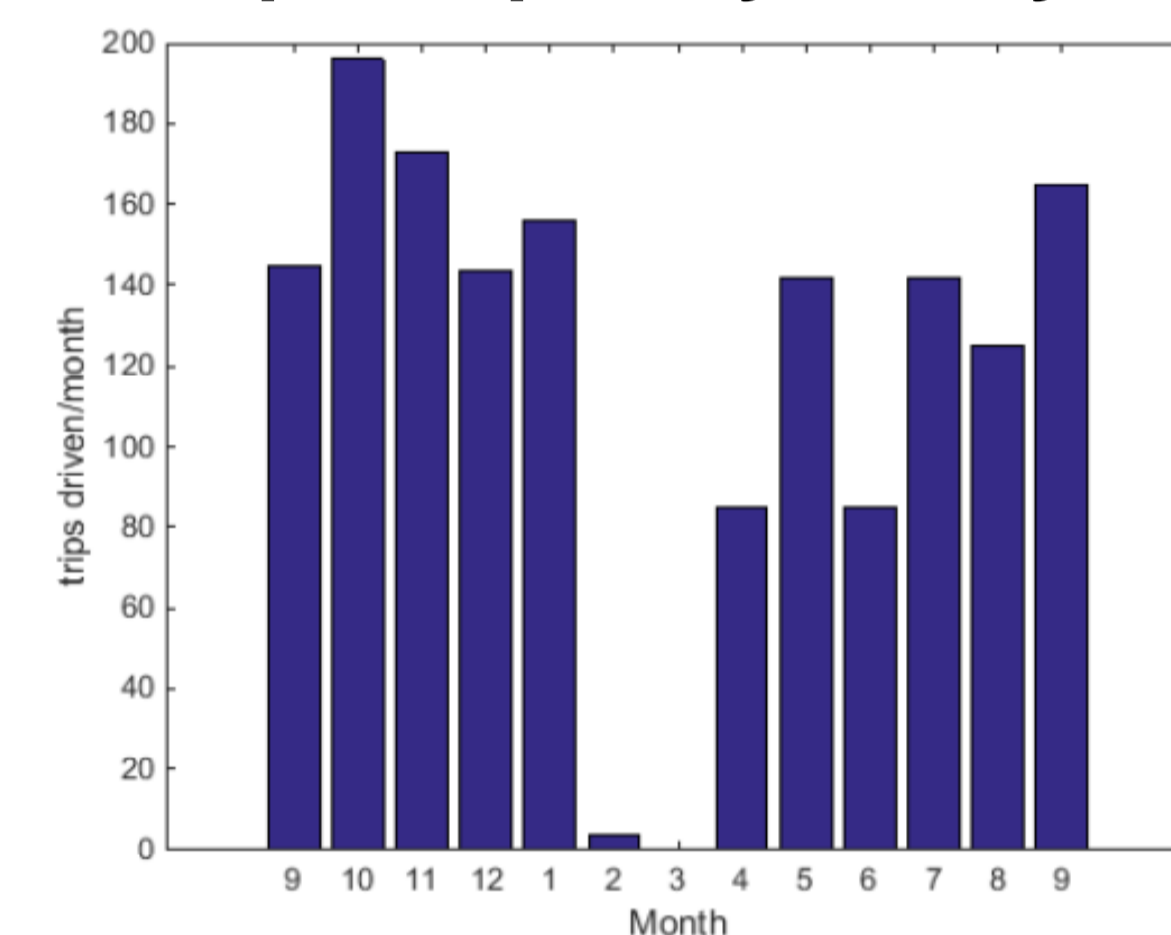
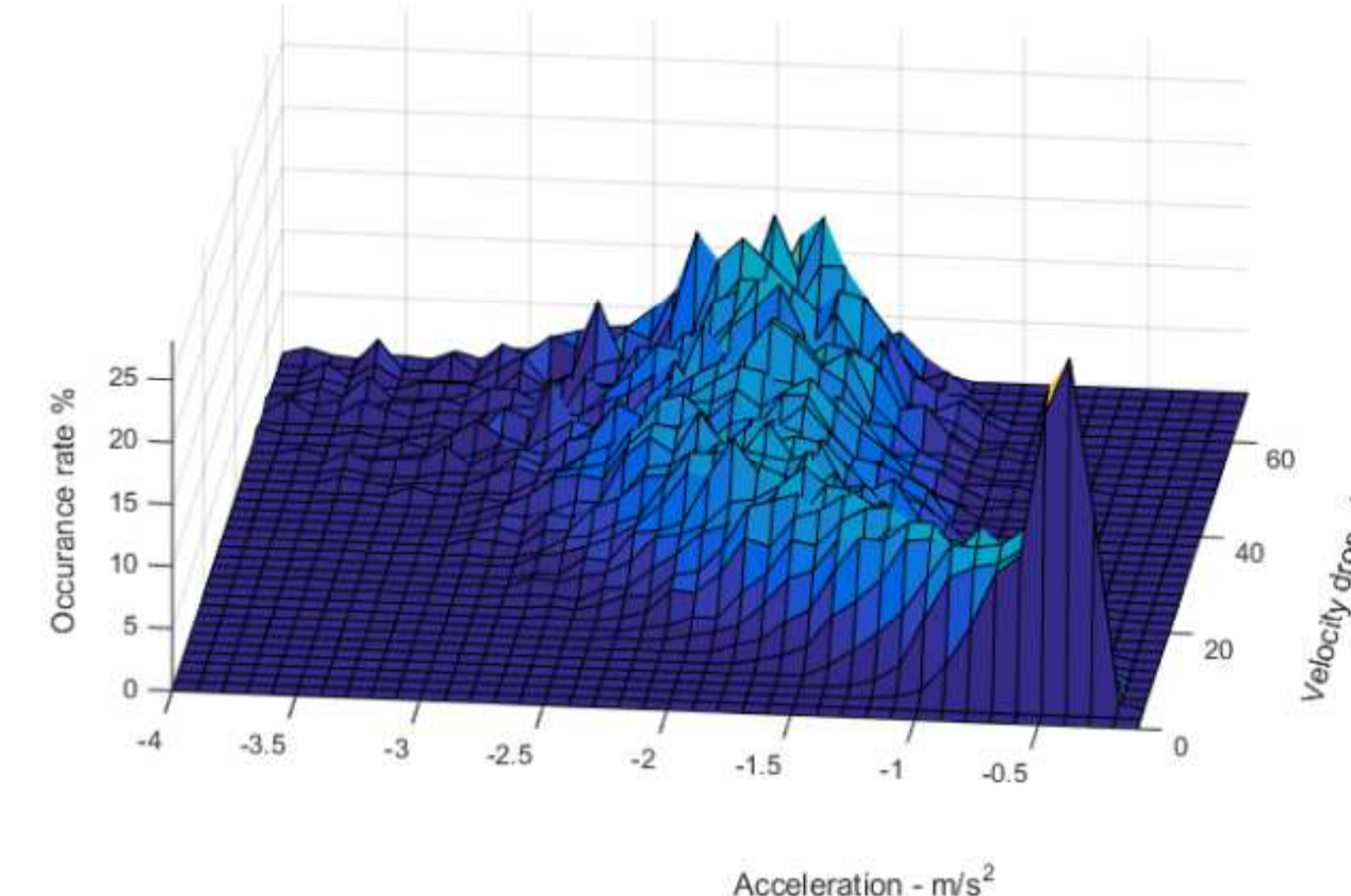### Speed choice profile
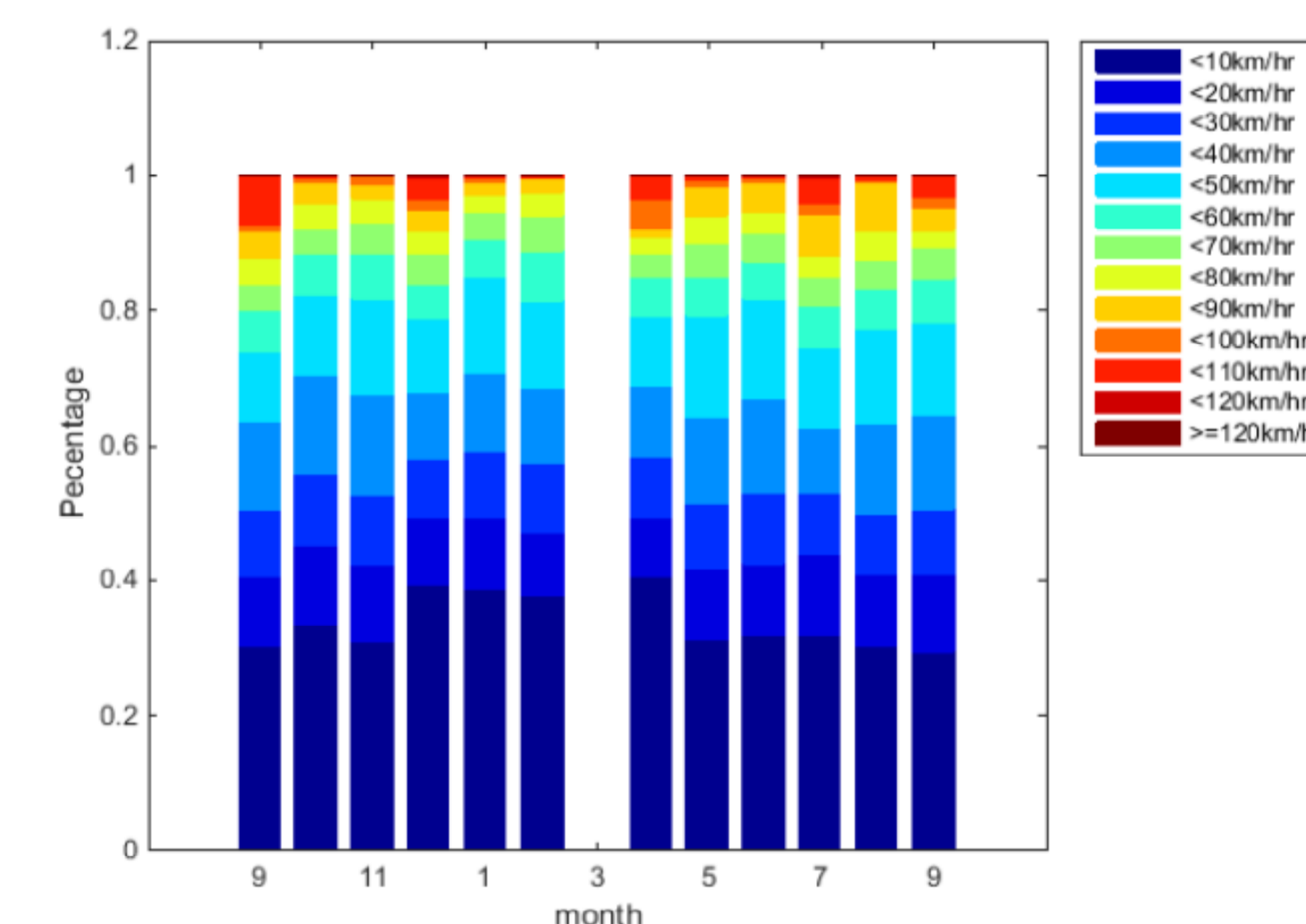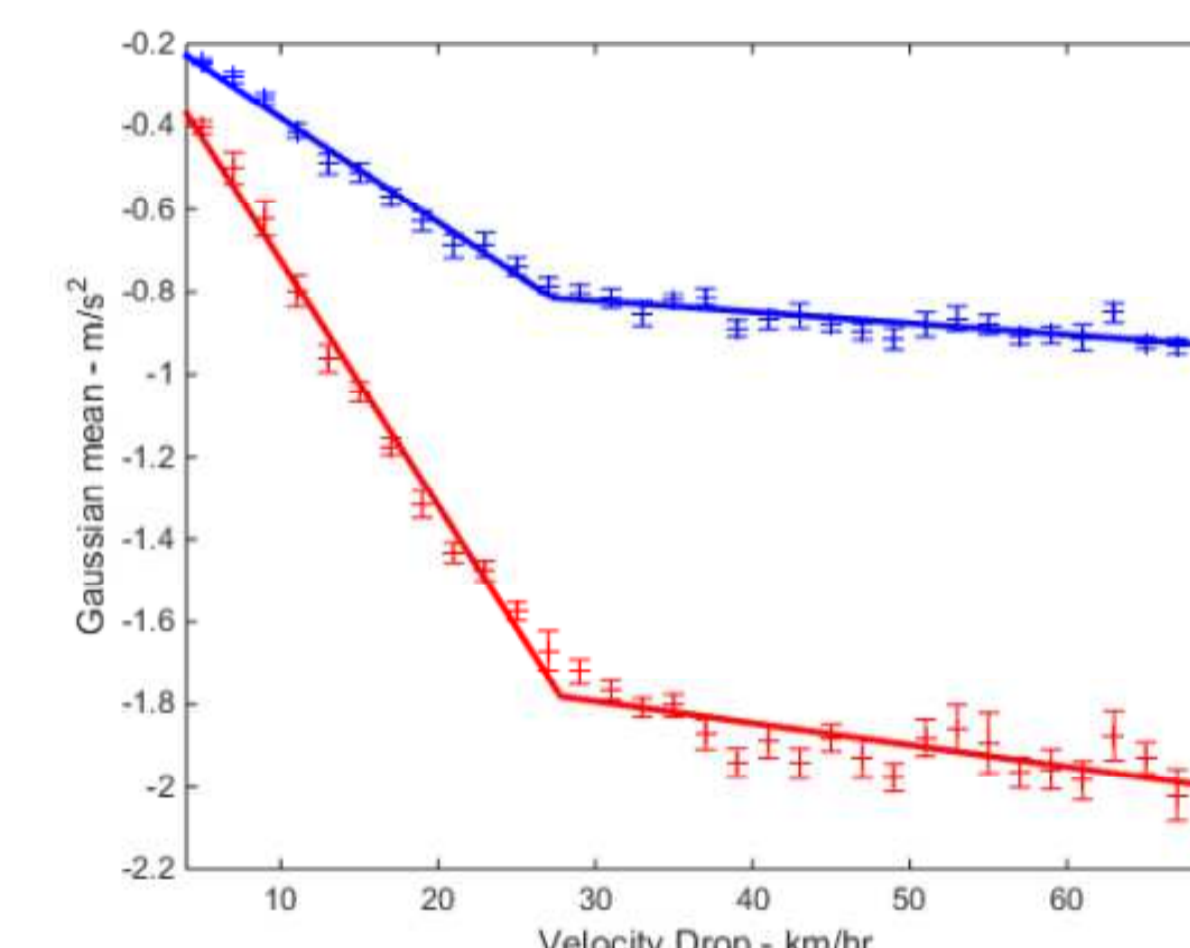

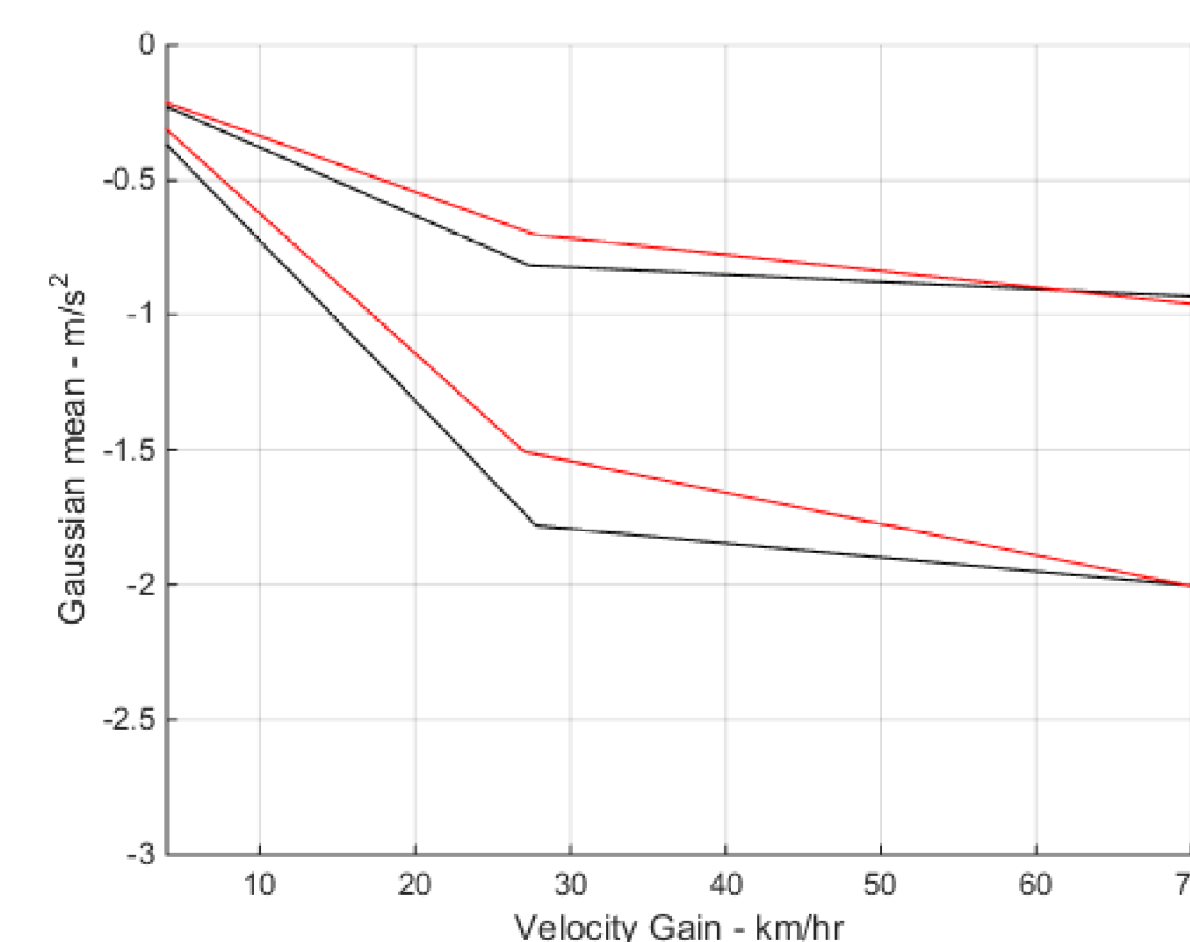### Time of Day profile

Analysis

Driver deceleration habits over 1 year – No indication of seasonal variation

Maximum Deceleration profile for driver for 1 year.

Two phase relationship as size of velocity change increases

Two phase relationship for driver decelerations shown for both Mean and Maximum Deceleration

Two phase profiles for two drivers showing difference in profiles for the drivers.

Result – driver attribute to use to differentiate drivers

Acknowledgements