

Electric Vehicle Research

CMU Robotics Institute

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ChargeCar | CREATE Lab
Carnegie Mellon University

CREATE Lab

Community Robotics, Education
and Technology Empowerment

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News Feature

Science funding: Science for the masses

The US National Science Foundation's insistence that every research project addresses 'broader impacts' leaves many researchers baffled. Corie Lok takes a look at the system.

Corie Lok

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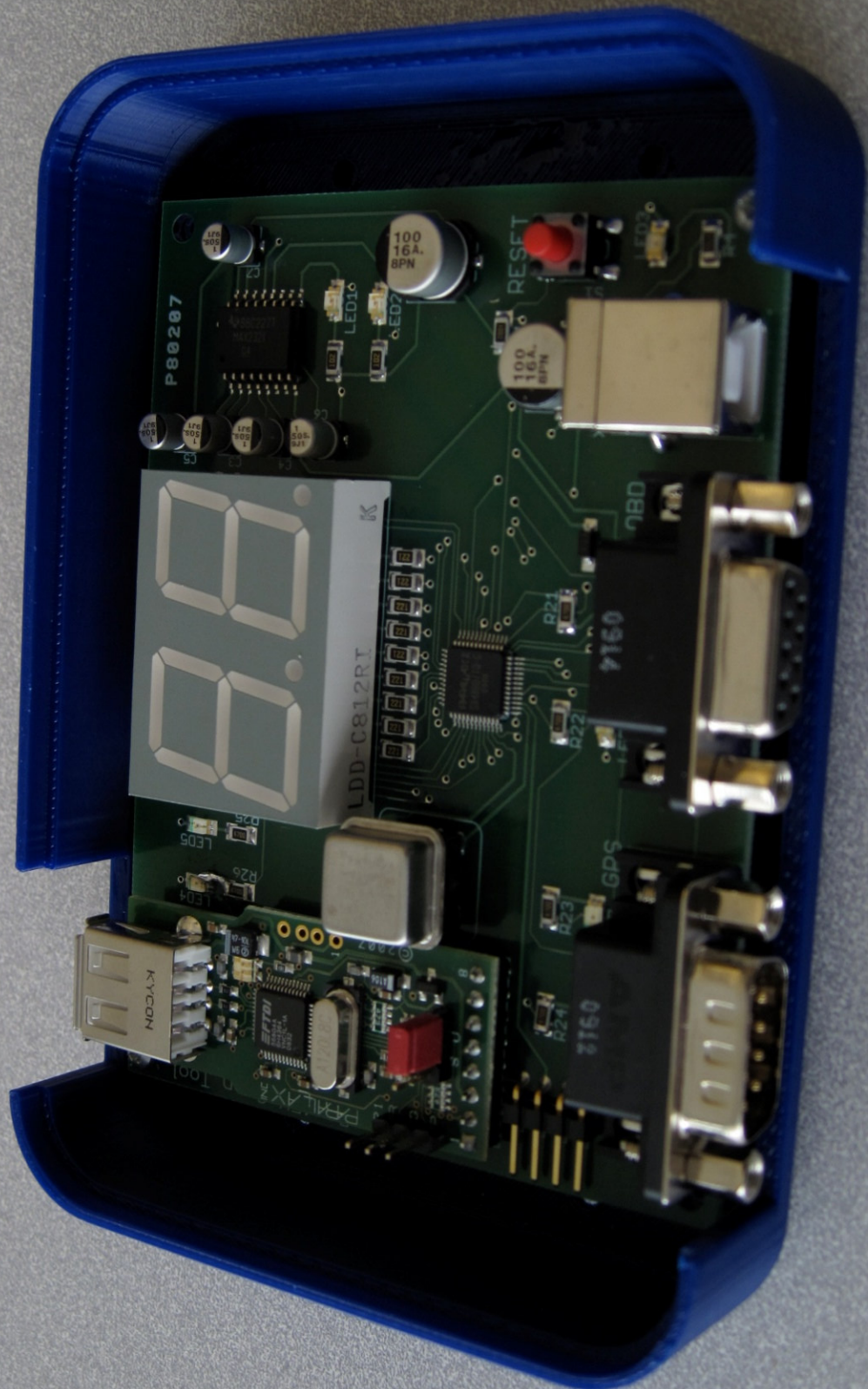
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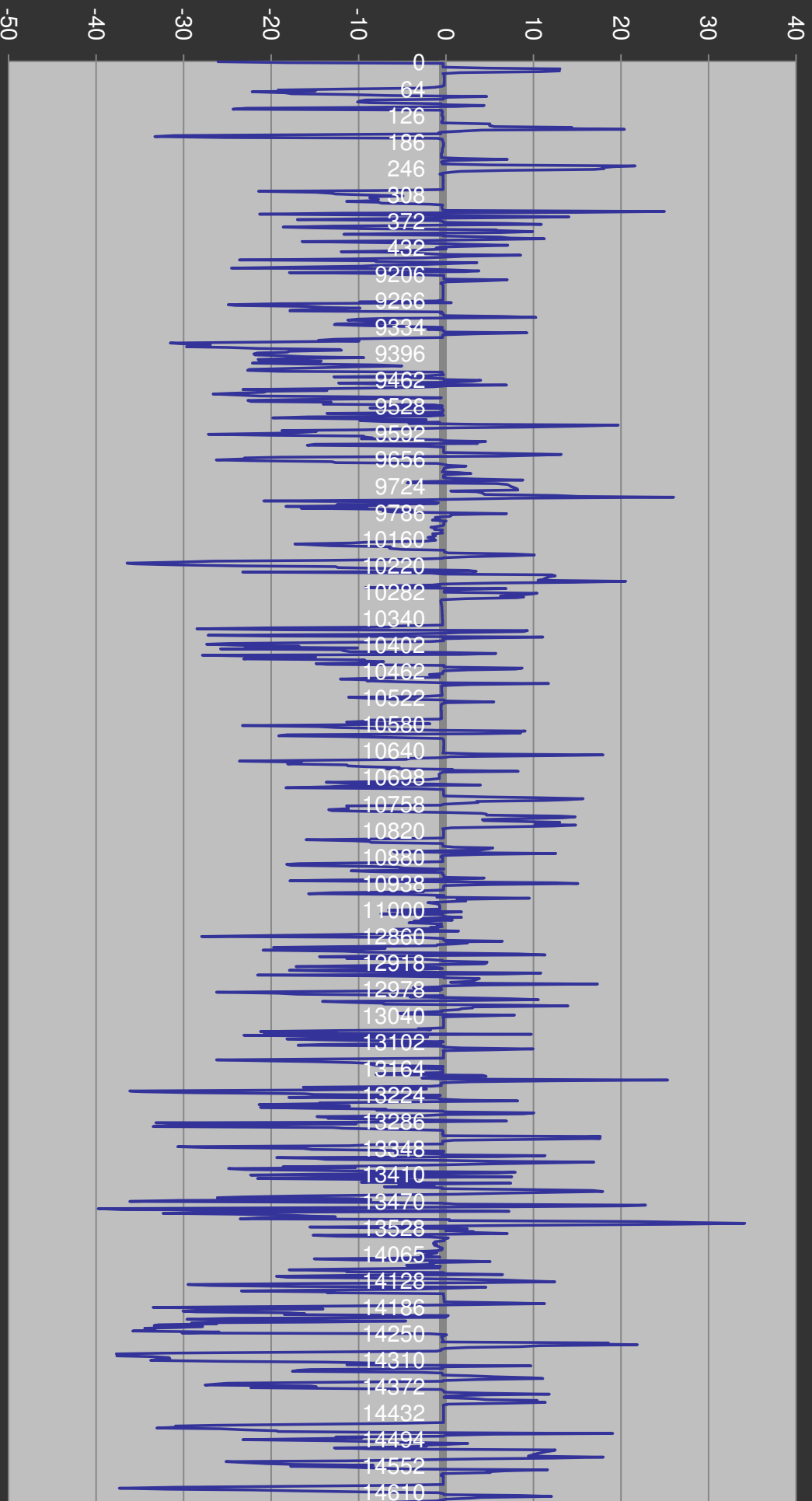
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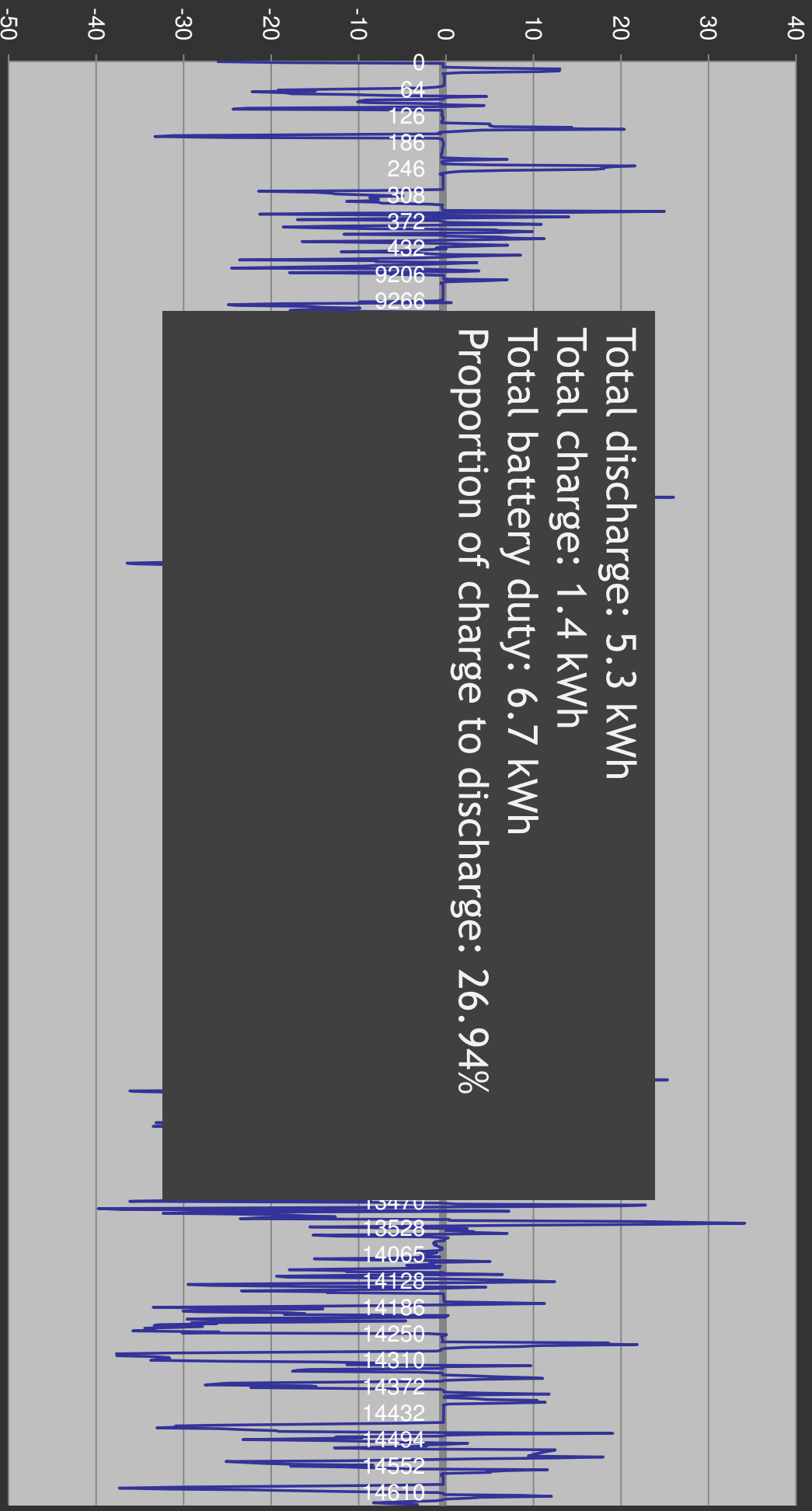




RAV4-EV Measured Power (kW)



RAV4-EV Measured Power (kW)



CHARGE CAR

Community Electrifying the Urban Commute

- HOME
- DATA
- SHARE
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- FORUM
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ChargeCar is dedicated to open, community-centered teamwork for making electric vehicles practical and affordable enough to revolutionize urban commuting. You can calculate the cost of commuting with an electric car using your actual commute data, compare the efficiency of gasoline and electric cars for your trips, browse commutes across the country and work on a smart controller for our programming contest.

Crowd-Sourcing the Commute:

The 21st century car should adapt to every person's commute. Browse our database to see how commutes across the country vary in terms of speed, distance, traffic conditions, hills and driver behavior.

Every Commute is Unique:

Electric cars are engineered for one kind of average driver. What if you had an electric car that was customized to maximize the efficiency of your personal commute? Visualize an electric car solution by uploading your commute data and contributing to an open, shared database.

Open-Sourcing the Controller:

With the right algorithms, a supercapacitor-battery combination will increase efficiency and drop costs, making electric vehicles viable. Join us by inventing controllers that use our data, to manage power intelligently in our open programming challenge.

➔ [Electrify Everyone's Commute](#)

➔ [Electrify My Commute](#)

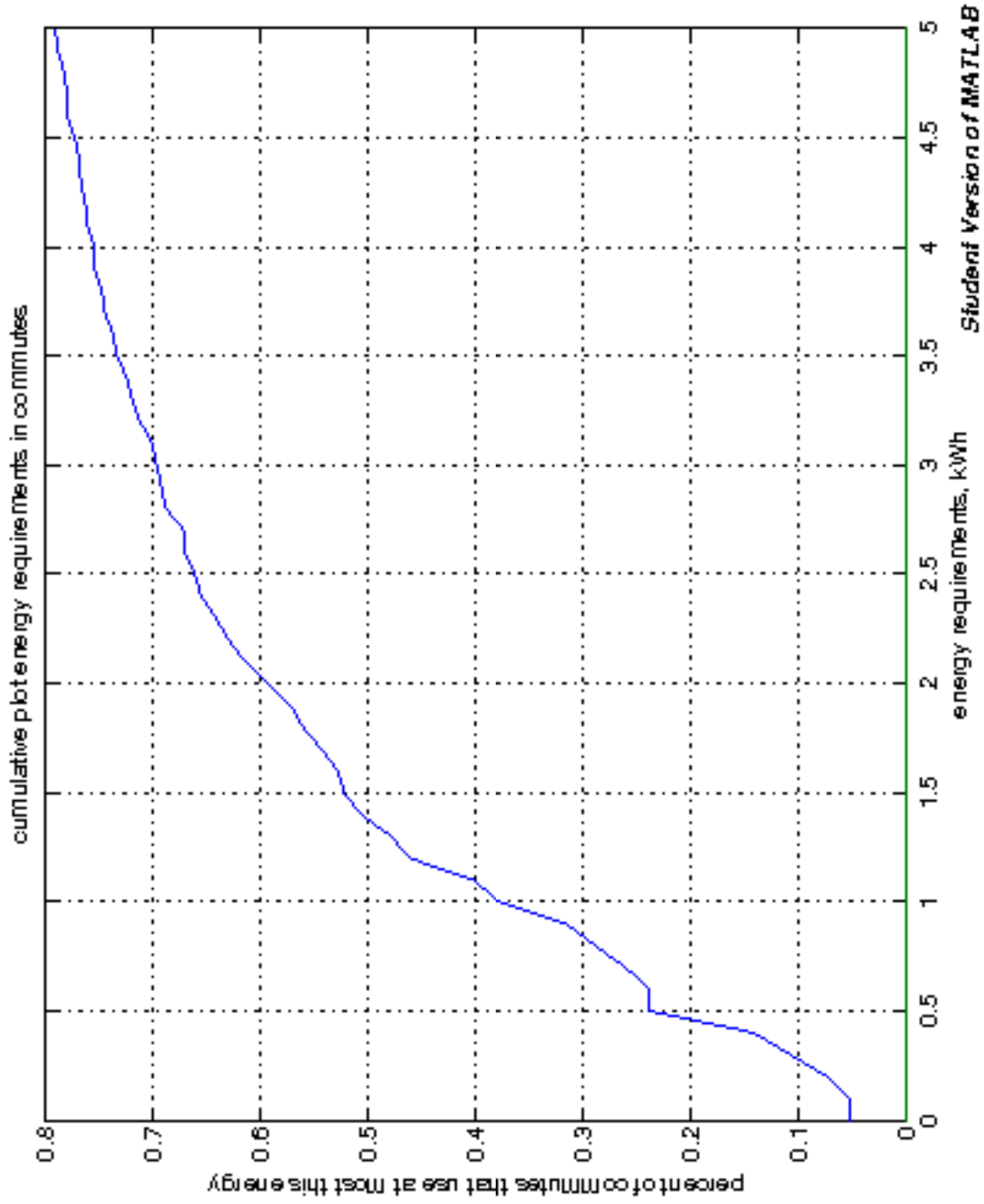
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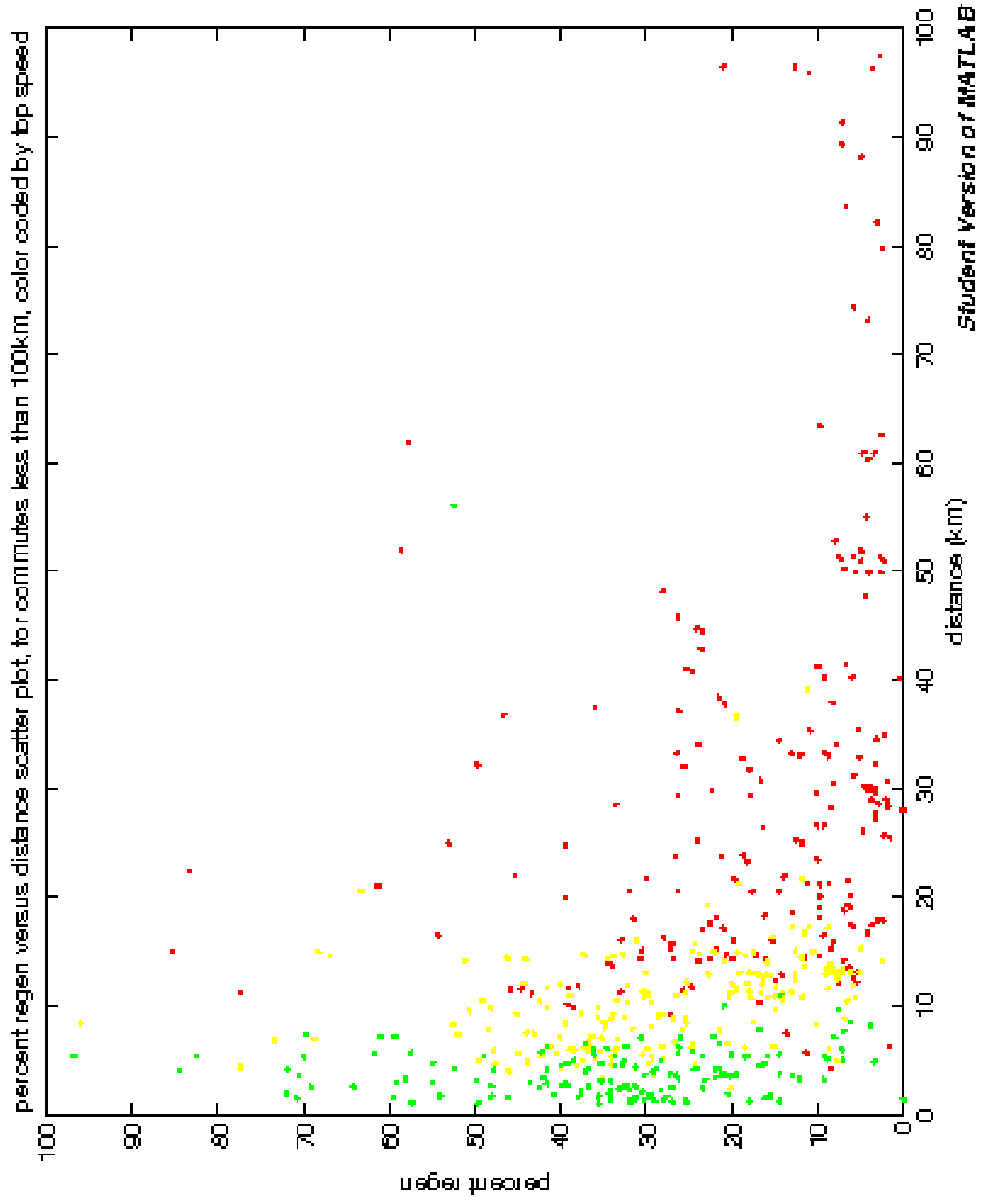
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ChargeCar is a project from the [GREATE Lab](#) at [Carnegie Mellon University](#)





The Urban Commute Conundrum



A perfect niche for
electric motors

The Urban Commute Conundrum



A perfect niche for
electric motors



A poor niche for
current batteries

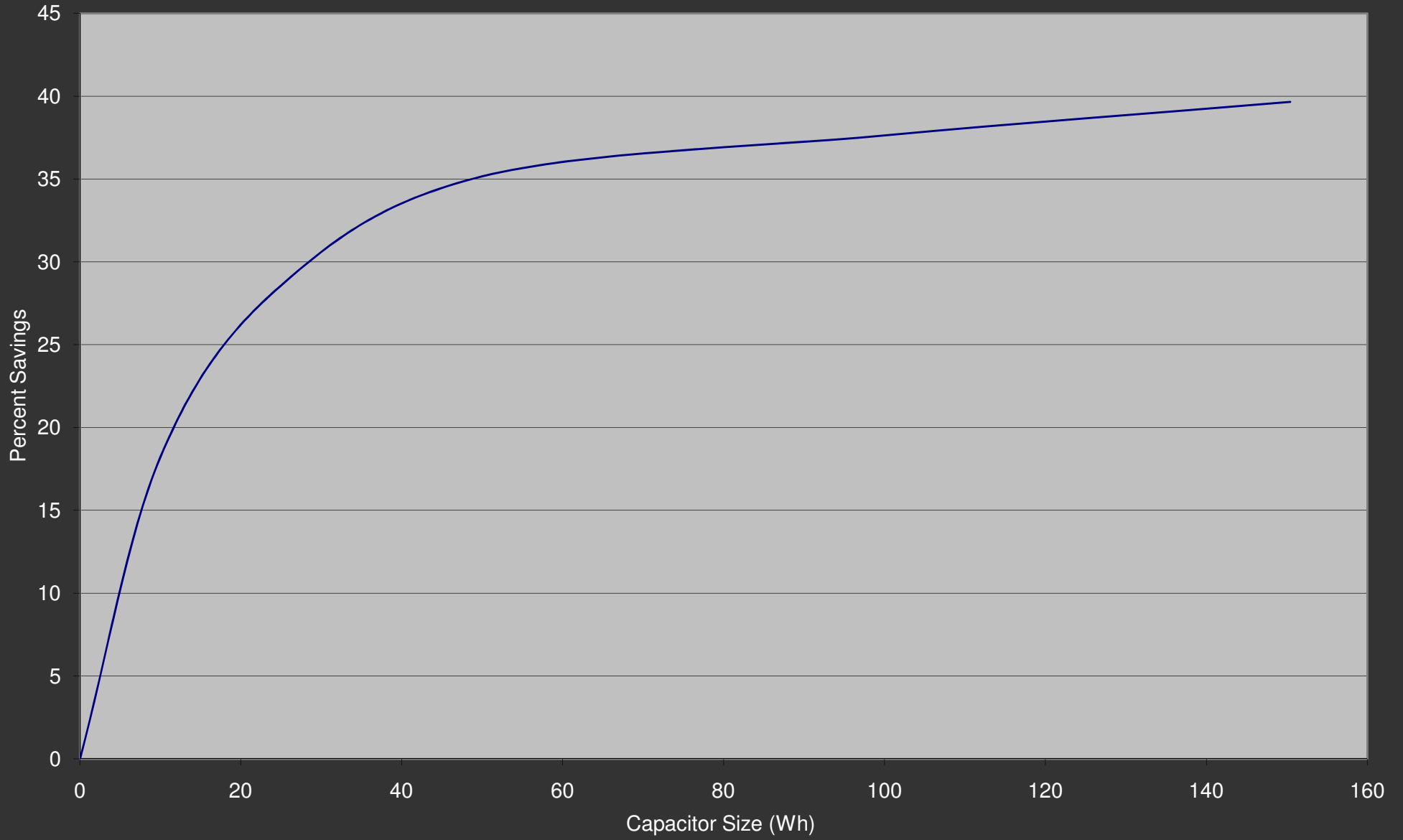


First-level Cache

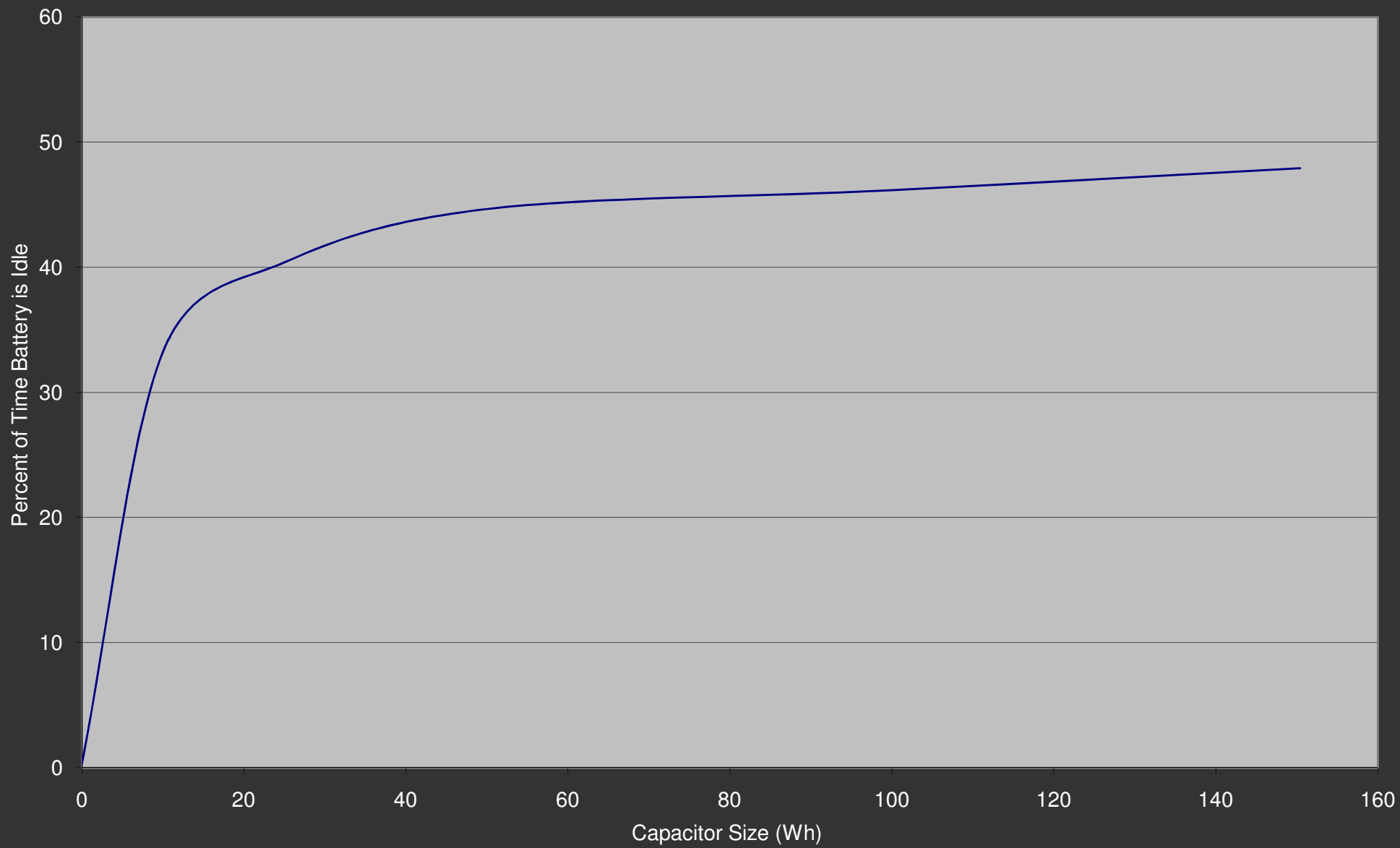
- How big of a cache do we need?
- How do we maximize cache hit rate?
- What are the new demands on the battery?



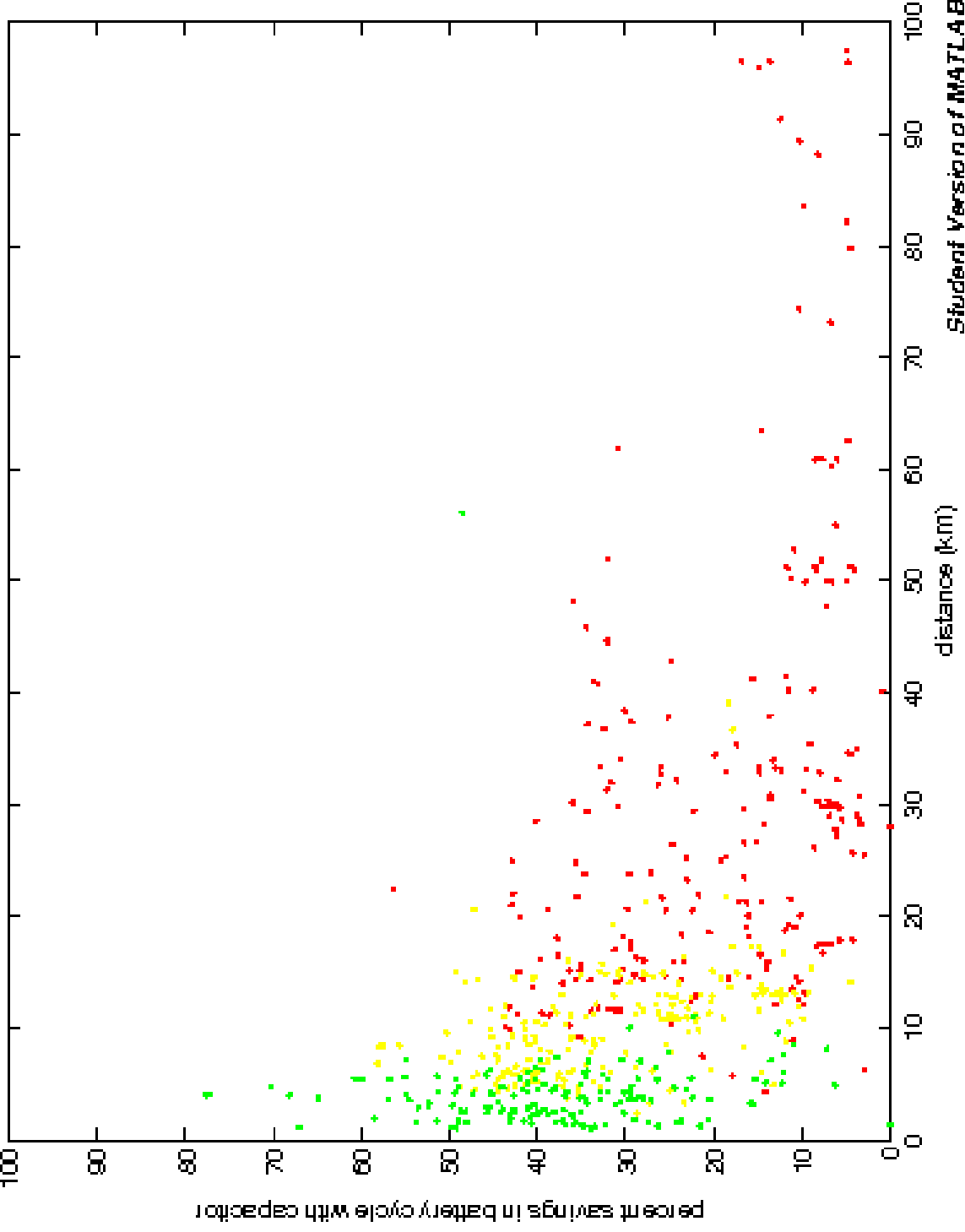
Battery Duty Savings And Capacitor Size



Idle Battery Time and Capacitor Size



battery duty savings versus distance scatter plot, for commutes less than 100km, color coded by top speed



ChargeCar Project

Model: Heavily instrumented duty tests to validate battery usage model

Control: Predictive supercapacitor-battery energy management

Hardware: Power electronics architecture for supercap-battery hybrid

Community Engagement: Local community empowerment through EV conversion



ChargeCar Programming Contest

8 anonymous open data sources

Monthly leader board

Open source policy

Twilight visualization

Grand prize: an electric car

Electric Garage

Open House series

EV clubs in local schools

Garage & mechanic engagement

Honda Civic 5th and 6th generation bodies



Legislative Agenda

Civic & Industry: parking and charging

State: tax discounts, enhanced inspection

Federal: conversion tax rebate

Acknowledgments

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