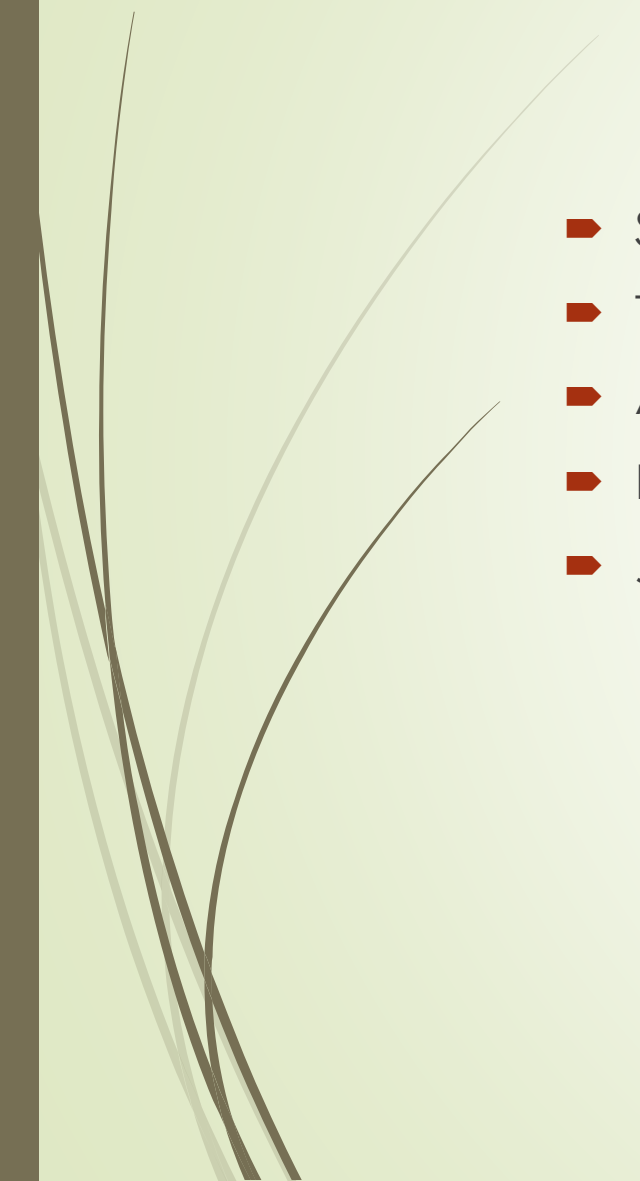




ECE 480 Team 11

Vibrational Energy Harvester

- Stephen Pliska
 - Tom Dochoda
 - Andrew Schroeder
 - Daniel Fresneda-Rojas
 - Jovanni Ivanaj
- 

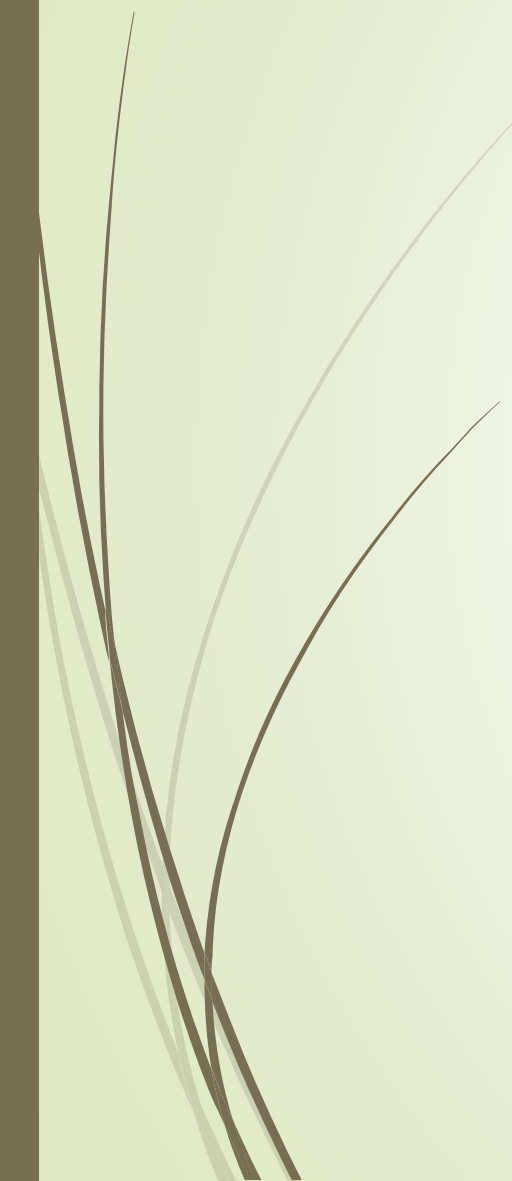
Vibration Harvesting

- Harness wasted vibrational energy to charge field instruments (VTP-3DV2).
- Prolong battery life, or even reduce the batteries needed.





Customer Critical Requirements

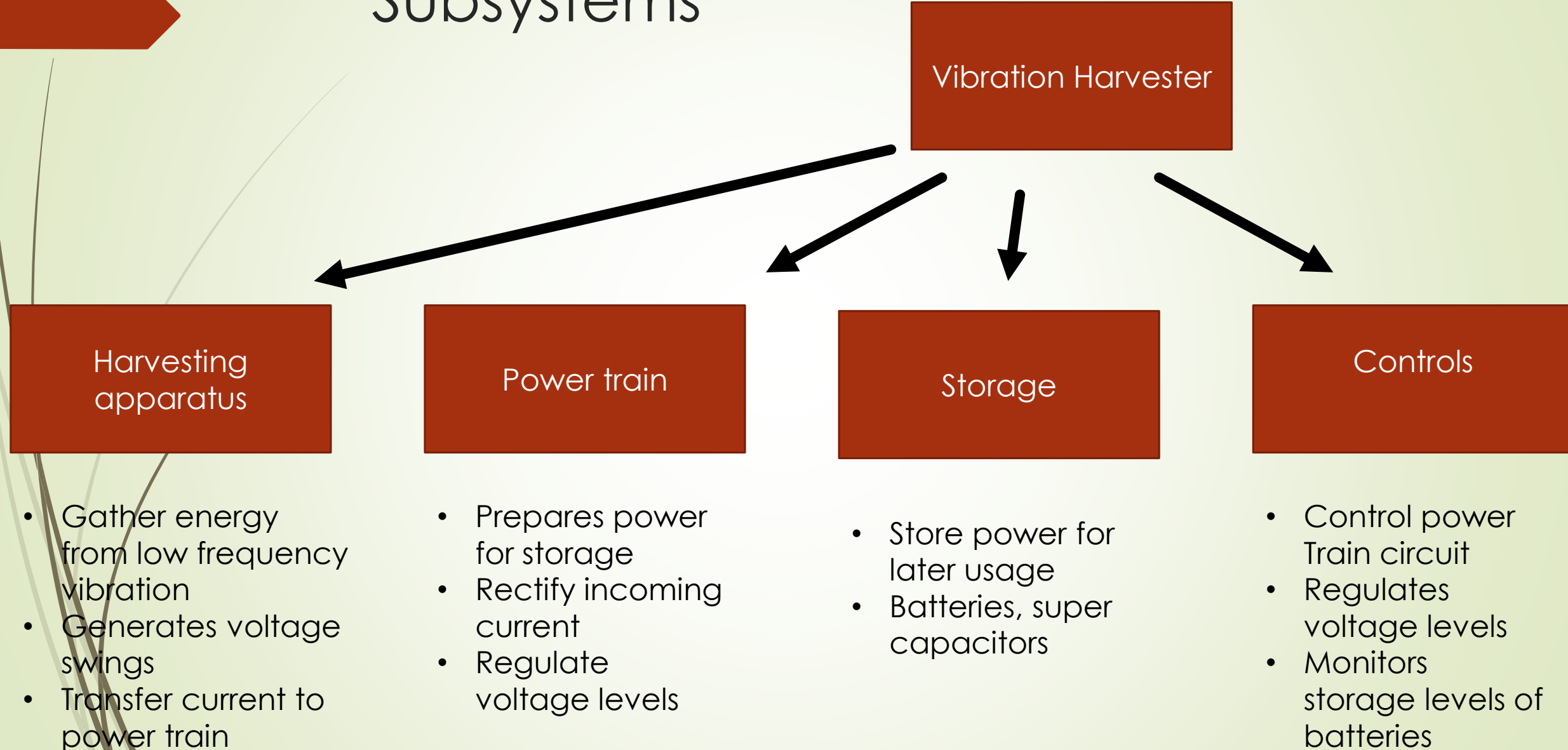
- ▶ Must generate usable power
 - ▶ Must be able to fit on a motor vehicle
 - ▶ Must operate with the VTP-3DV2
 - ▶ Needs to be rated at 3.6 volts
 - ▶ Supplies a current of 5mA or higher
- 

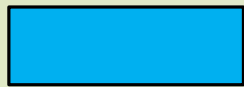


System Level Specs

- Apparatus to convert vibration energy into electrical energy
- A circuit to rectify incoming power
- Regulating circuits
- Controls for the power conversion circuitry
- Power storage

Subsystems





Tom



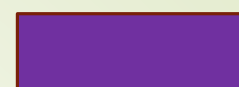
Daniel



Steve



Jovanni



Andrew

Individual Roles

Vibration Harvester

Harvesting
apparatus

Power train

Storage

Controls

- Gather energy from low frequency vibration
- Generates voltage swings
- Transfer current to power train

- Prepares power for storage
- Rectify incoming current
- Regulate voltage levels

- Store power for later usage
- Batteries, super capacitors

- Control power Train circuit
- Regulates voltage levels
- Monitors storage levels of batteries



Milestone

- Choose harvesting method 2/10/2016
- Design Harvesting apparatus 2/24/2016
- Design power train circuit 3/2/2016
- Implement controls 3/16/2016
- First Prototype 3/24/2016
- Integrate with portable device 4/5/2016
- Final prototype 4/26/2016
- More information in GANTT chart

Design Specifications/Schedule: **Tom**

- Specs for vibration harvester
 - Maximize voltage output
 - Low frequency oscillations
 - Hand held design
 - Must attach to power train
- Design a device using an electric magnet to generate electrical energy from vibrational energy.
- Milestone and schedule
 - Assemble materials (2/15/2016)
 - Assemble prototype (3/8/2016)
 - Final prototype (4/6/2015)

Design Specifications/Schedule: **Daniel**

- Specs for voltage regulation
 - Max battery capacity 2600 mAh
 - Battery voltage = 3.6v
- Develop a system that monitors and corrects voltage levels of storage devices to prevent overcharging and damaging to the system
- Milestone and schedule
 - Formulate system design (2/15/2016)
 - Prototype system (3/15/2016)
 - Final system (4/13/2016)



Design Specifications/Schedule: **Steve**

- Power Train specs
 - Rectify incoming power
 - Regulated out of 3.6 v
- Design a circuit to regulate power from the harvesting apparatus to the storage cells
- Milestone and schedule
 - Design circuit (2/21/2016)
 - Test Prototype (3/8/2016)
 - Implement into final design (4/20/2016)

Design Specifications/Schedule: **Jovanni**

- Specs for rechargeable cell
 - 3.6 volt output
 - Supply 5mA current
 - Holding capacity of 2600 mAh
- Devise a rechargeable battery system that can store power provided by the harvesting apparatus
- Milestone and schedule
 - Finalize system design (2/21/2016)
 - Test prototype (3//8/2016)
 - Test final design (4/20/2016)

Design Specifications/Schedule: **Andrew**

- Control Specs
 - Regulate the power train circuit
 - Interconnect all subsystems to operate together
 - Reprogrammable for other applications
- Develop a program that can control the power train circuit and monitor project oppressions to optimize performance
- Milestone and schedule
 - Decide on programming platform (2/15/2016)
 - Finalize design (2/21/2016)
 - Test prototype (3/21/2016)
 - Test final design (4/22/2016)