Background:
- Getting an FSAE vehicle to pass the pre-competition safety checks is very difficult. Only one out of every eleven vehicles passed the checks and were allowed to compete in the events last year.
- Jamdani’s task has been to design and fabricate all safety systems the 2017-2018 FSAE Rulebook, followed by testing each system to confirm proper functionality before being scaled up and tested at a racing event.

Project Requirements:
- Create and test all applicable safety systems in the EV section in the rulebook.
- Ensure the work can be understood and scaled up by future FSAE-EV students.

Specifications:
- AIRs: Two accumulator isolation relays before and after the 24V battery system (Two 12V)
- Three shutdown buttons to be located in the cockpit and both sides of the chassis (AIRs)
- Brake System Plausibility Device (80% compression and 16 or more amps) (AIRs)
- Insulation Monitoring Device present (AIRs)
- Tractive/GLV master switches present (AIRs)
- Battery Management System: Monitors temp., current draw, and voltage (AIRs)
- Vehicle Control Unit for pedal error detection
- Pedal position (APPS/BPPS) monitoring (VCU)
- A High Voltage Disconnect (AIRs/Batteries)
- Brake Overtravel Switch (AIRs)

Impact Analysis:
Environmental: Opens up an opportunity for students to learn more about EVs, potentially go into the EV field, and help make transportation more environmentally friendly.
Economical: Research was focused on the performance of electric vehicle safety systems. Improved safety systems will result in the ability to experiment with more powerful tractive systems.

Future Work:
- With safety system already designed, the probability of passing the FSAE EV pre-event tests has been dramatically increased.
- Scaling up safety systems to match a higher powered vehicle will be necessary.
- The BSPD and HVD will require a higher rated current transformer and plugs, respectively.

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Team Jamdani