What?

- BRP introduces electric snowmobiles, Grand Touring Electric and Adventure Electric, for emission-free winter adventures

How?

- Engineered a IP67 charge port for all BRP EV product line

- Oversaw development of charge port, cables and heater system

- Moved from prototypes to production with thorough validation

- Developed prototypes, concluding with a protective rubber flap for charge port snow protection

Results

- The first electric snowmobile enters production for BRP

- Revolutionizing snowmobiling, reducing carbon footprint, and creating electric models across product lines

- Patent WO2023073673A1

What?

- Designed a groundbreaking tilting 3-wheel urban scooter

- First and only electrical engineer hired at BRP Design and Innovation Studio (D&I)

- Spearheaded the creation of the first electric vehicle at D&I

How?

- Led cluster development, crafted CAN matrix, and programmed inverter
- Programmed electronic tilt kickstand, refined algorithm through testing
- Implemented blind spot detection
- Led vehicle architecture, chose LV and HV components, integrated off-the-shelf and in-house modules

Results

- Successfully delivered a functional vehicle for marketing research

- Unveils electric concepts at Club BRP 2020, exploring future possibilities for powersports

- Established a platform for ongoing advancements in electric vehicle development at BRP
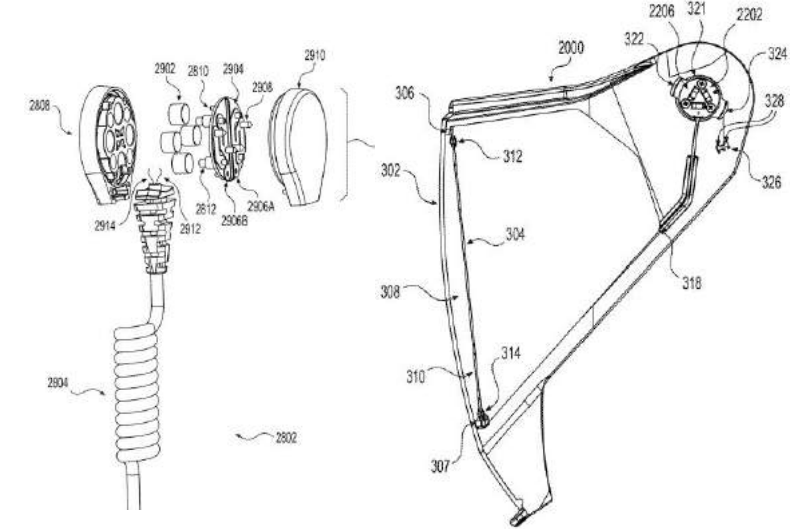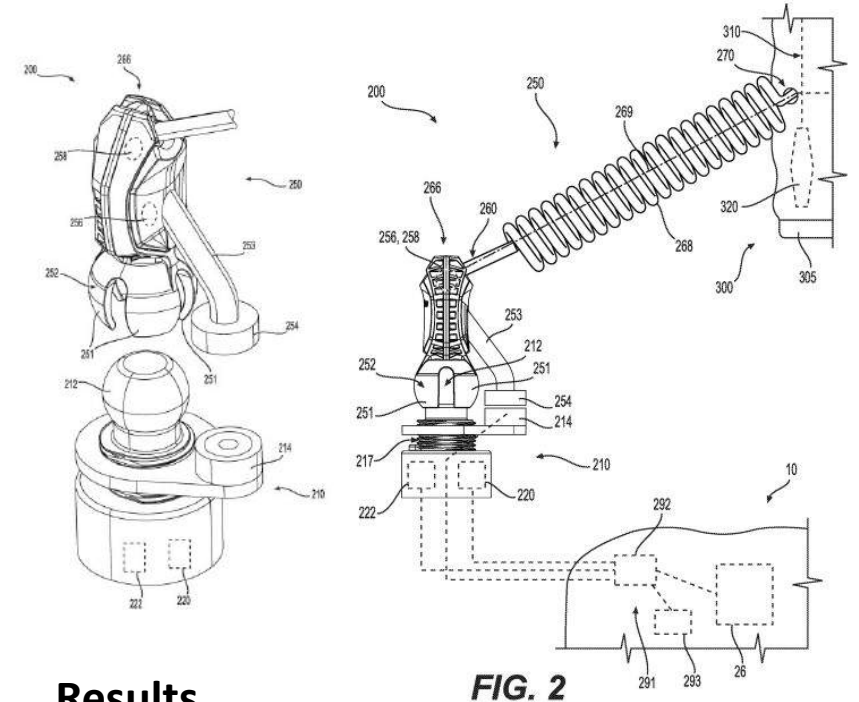
What?

- Cutting-edge snowmobile helmet featuring an innovative magnetic connector for powering the heated visor, eliminating the need for a traditional RCA-type connector

- Batterie free

- High visibility position LED

How?

- Rapidly prototype diverse methods of supplying power to the helmet for optimal user experience

- Collaborate with industrial designer and ergonomic teams

Results

- Best selling Ski-Doo helmet

- Trademark "*eLinq*"

- Patent US20170215510A1

FIG. 2

What?

- Modern snowmobile have a tether cord to shuts off the engine if the rider separate

- This innovation combines the tether with a power cable to provide energy to the rider's helmet

How?

- Optimize time-to-market by leveraging the existing eLinq helmet concept

Results

- This magnetic connector speeds up helmet connection, saving time for faster snowmobile rides

- Patent US20190299882A1
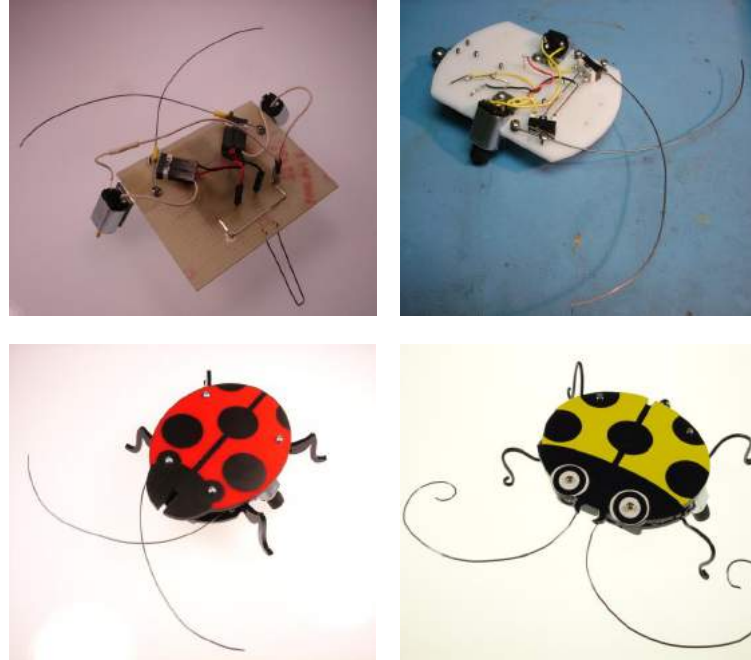
What?

- The Beetlebot is a very capable obstacle avoiding robot using no silicon

- Science fair: creating robots with recycled components from VCR, playstation 1, etc.

How?

- Iterative prototyping to perfect the Beetlebot aesthetics and functionality

- Create online tutorial and videos on how to build your own Beetlebot with more the 1.3millions combined views

Results

- Brought to market my own robot creation "Beetle Bot" a (solderless kit)

- Publication of an article on how to make my "Beetle Bot" in the MAKE magazine volume 12, 2007

- The Khan Academy "Spout" is based on the Beetlebot

What?

- Self-navigating robot designed to locate and push opponents out of a round arena.

How?

- Design in SolidWorks the entire robot with various wedge design

- Program an Arduino to read multiple optical sensor and move accordingly

- Test different moving behavior for effective search and push

Results

- Undefeated for 2 years at Concordia University competition

- Better opponent tracking

- Lower CG

- Effective front wedge

- A stepping stone to competing in the international sumo tournament in Japan with a new robot design

3lbs Combat Robot

What?

- Build remote control 3lbs combat robots

- Create an event in 3 weeks

- Create a safe arena

- Skill development and resourcefulness

How?

- Accelerated development by selecting readily available off-the-shelf components for rapid integration, meeting the tight 3-week timeline

- Constructed a secure arena by repurposing surplus Lexan panels from COVID, obtained at no cost

Results

- Mobilized 6 colleagues to build combat robots in 3 weeks

- Spawned 2 additional successful events

- Trained mechanical engineers in soldering and electronics

- Fostered resourcefulness, employing zip-ties for rapid robot repairs

linkedin.com/in/JeromeDemers   JeromeDemers.com/blog/portfolio
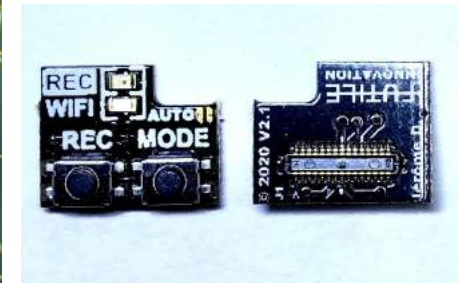
What?

- Take apart a GoPro action camera to make it lightweight and compact to be used on flying drone

How?

- Reverse engineer the GoPro motherboard for signals and identify part number of connectors

- Design DC/DC converter to power the GoPro from external power source

- Made various PCBs with Altium to enable different camera configuration

- Design 3D printed housing in SolidWorks

Results

- Successfully launched and achieved five-digit sales

- Achieved 64% weight reduction

- Well receive by the FPV community

J1772 Charge Port

Kia EV6

Heater

Transferring V2L...

86%

⚡ 1.4 kW

2484 km
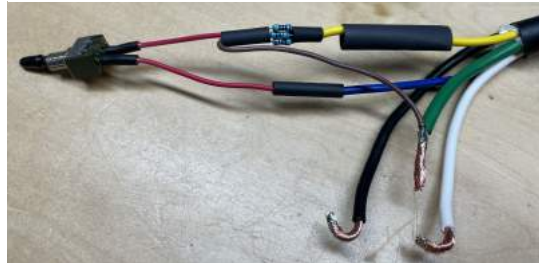
What?

- This lets me connect any 120V 15 Amp device into the J1772 charge port of a Kia EV6

- Design a minimum viable product (MVP) to experiment with Vehicle-to-load (V2L) feature on a Kia EV6 car

How?

- Designed and 3D printed an enclosure in SolidWorks to accommodate the 120V outlet.

- Added a switch to activate the V2L

- Incorporated a strain relief on the cable assembly

Results

- Design a versatile portable device capable of brewing coffee and powering a 1300W heater
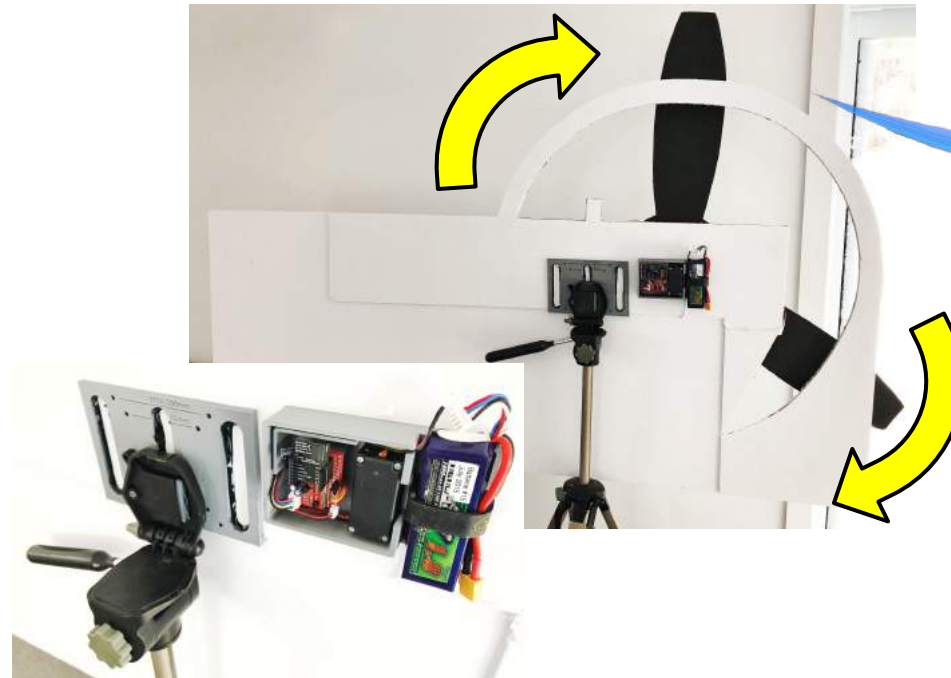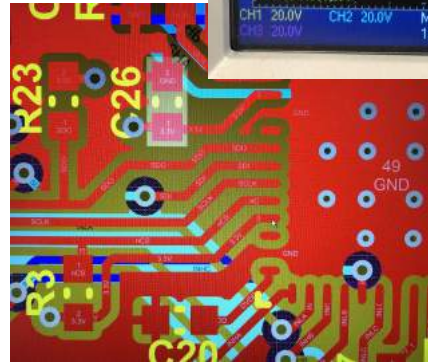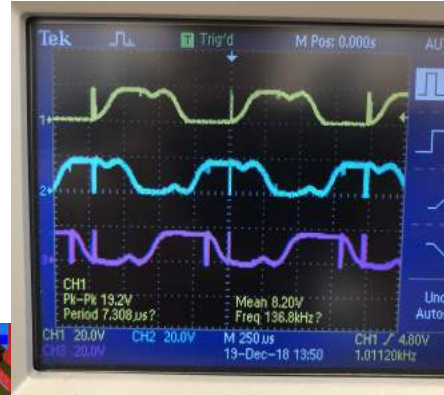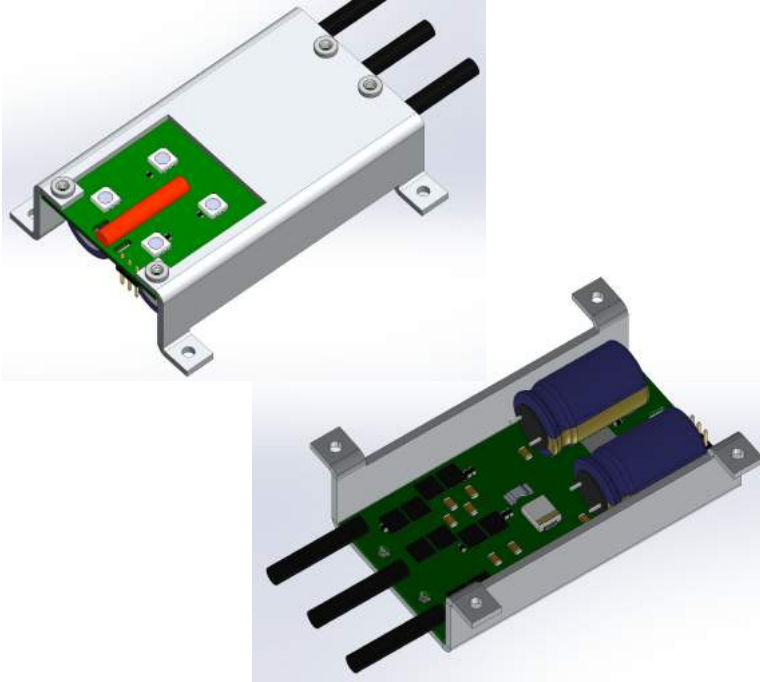
What?

- Create a challenging and dynamic obstacle course for flying drones

- Design an app to control the difficulty of the obstacle course

- Incorporate lightning for low light flying

How?

- Program Simblee microcontroller for both Bluetooth communication and motor control

- Use foamcore for quick fabrication

Results

- Fully functional and challenging obstacle course control through a mobile app

- Catered to different skill levels with adjustable gate speed

- Youtube video
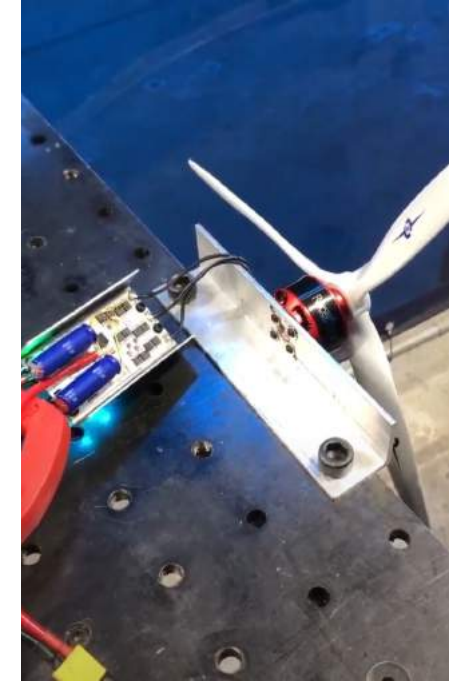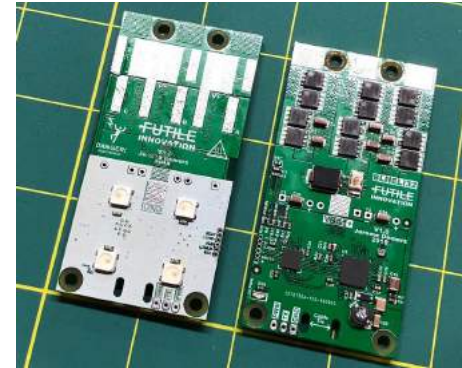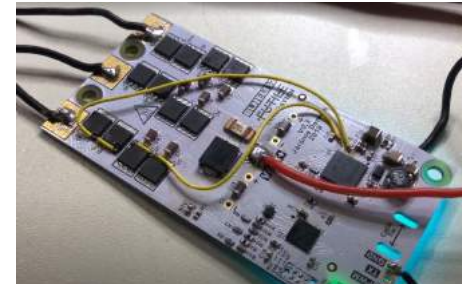
What?

- Develop a 50V brushless speed controller tailored for a large drone utilizing Blheli_32 firmware

- Integrate a heatsink for efficient thermal management

- Include an RGB LED for personalized color customization

How?

- Specify requirements, including sensorless operation and PWM input

- Select components with the goal of achieving a compact PCB footprint and simplifying the design, aiming for fewer parts and a smaller BOM

- Develop a 4-layer PCB design using Altium

Results

- Project setback: Peak power not attainable

- Lesson learned: Closed-source firmware limits customization of motor control algorithms

- Next step: Utilizing the open-source AM32 project for the upcoming controller