



## 2023-2024 Sponsor Packet



# What Is BOLT

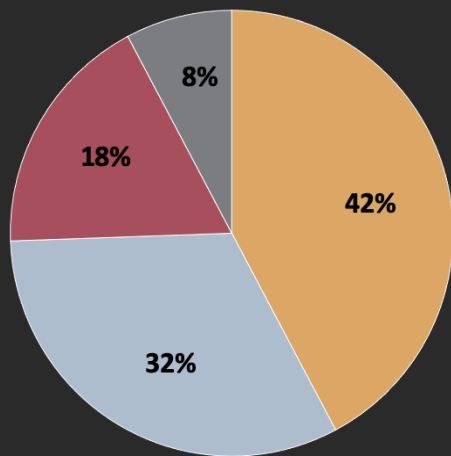
BOLT is a motivated group of students who strive to evolve electric vehicle technology by designing, manufacturing, and racing high-performance electric motorcycles. This group of 90 Virginia Tech undergraduate students from several academic majors biennially builds an electric motorcycle to compete in the AHRMA varsity challenge.



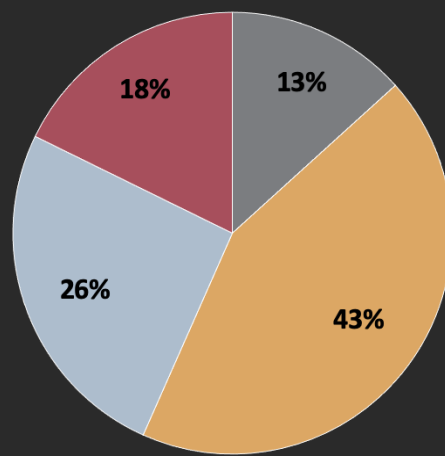
Our team is unique as we are not constrained by prohibitory requirements. The competitive goals of this team begin and end at completing the 11km race as fast as possible. This allows us the freedom to undertake radical design challenges such as a custom frame and battery pack that is completely designed and manufactured in-house, and complete a design that has 200 horsepower and can reach speeds over 200 miles per hour.

## Demographics

Year



Major



■ Freshman 38    ■ Sophomore 29  
■ Junior 16    ■ Senior 7

■ Electrical Engineering 12    ■ Mechanical Engineering 39  
■ Computer Engineering 23    ■ Other 16

# History

Established in 2011, our mission is to demonstrate to the motorsport industry that a vehicle can be both zero-emission and highly competitive in racing environments. We also strive to maintain the reputation and history of innovation at Virginia Tech. We invite you to join us as we defy the bounds of what's possible and redefine expectations for electric racing vehicles.



2011-2012

## BOLT I

-International  
Competition: 3rd Place  
-North American  
Championship: 1st Place



2013-2016

## BOLT II

-AHRMA eMoto Series:  
1st Place



2017-2018

## BOLT III

-AHRMA eMoto Series:  
2nd Place



2019-2022

## BOLT IV

-Bike was successful in  
testing but did not see a  
race due to Covid



2021-Present

## BOLT VS

-successful testing in  
2022  
-overhauling the  
powertrain to significantly  
improve performance

2023-Present



## BOLT D1

-In development

# Major Projects

## **BOLT VS - THE NEXT STEP IN ELECTRIC MOTORSPORTS**



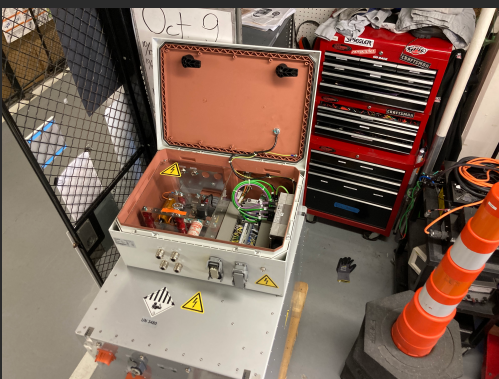
The BOLT team has developed the fifth generation BOLT Motorcycle, BOLT VS. Last year, the team fabricated a custom powertrain, but this year we saw an opportunity to improve significantly by overhauling the powertrain. In preparation for the BOLT VS race, the team is currently working on performing validation testing on the frame and developing a new powertrain.

## **BOLT D1 - OUR FIRST STEP IN ELECTRIC OFF-ROAD MOTORSPORTS**



The team is currently developing the first generation of an electric dirt bike. This is the first year the BOLT team has attempted to take electric motorsports off-road. The team will have to go from nothing to a fully functional dirt bike that will be taken to competitions. To accomplish this, we will develop a custom frame, powertrain, control systems, suspension system, brake system, and more.

## **BUS BATTERY MOBILE CHARGING STATION**



The BOLT team is currently developing a mobile charging station to charge our bikes at competitions using a high voltage bus battery. We will also be designing a cart to transport the 1100 lb battery. We will be designing and implementing a system to allow us to charge our bikes multiple times at competitions and track days. This will allow us to compete more and test more efficiently.

# Our Subteams



**Chassis**

Responsible for designing and manufacturing a custom frame, attaching and maintaining brakes, designing custom mounts for components, and handling for the bikes.



**Controls**

Responsible for designing and programming a custom rider interface, creating custom-designed PCBs, data acquisition, and live communication of data to the pit.



**Powertrain**

Responsible for the drive system, researching, designing, and fabricating a custom battery pack, and data validation.

ID	Name / Title	Type	Start Date	End Date	Resolves	Predecessor	Notes	Comments	Task Color
1	1 BOLT 2023 2024	project	8/21/2023	5/29/2024					
2	1.1 Initial Planning phase	group	8/21/2023	10/2/2023					
3	1.1.1 Project delegation & admin work	task	8/21/2023	9/2/2023					red1
4	1.1.2 Fall Semester begins	milestone	8/21/2023	8/21/2023					blue2
5	1.1.3 Co-Intro	milestone	8/27/2023	8/27/2023					blue2
6	1.1.4 Contact Oliver's Driveshafts	task	9/4/2023	9/11/2023	Denial				blue2
7	1.1.5 Find acceptable spline standard	task	9/4/2023	9/11/2023	Denial				blue2
8	1.1.6 Design test pattern with spline shaft	task	9/12/2023	9/20/2023	Denial				blue2
9	1.1.7 Research high power transistors	task	9/4/2023	9/15/2023	Solve				blue1
10	1.1.8 Research when gears	task	9/4/2023	9/19/2023	Kyle				green2
11	1.1.9 Design SCU feature set	task	9/4/2023	9/18/2023	Colton				yellow1
12	1.1.10 Design PDU feature set	task	9/4/2023	9/18/2023	Colton				yellow1
13	1.1.11 Discuss new locations of charge taps	task	9/4/2023	9/26/2023	George				purple1
14	1.1.12 Discuss how to make packs fit	task	9/4/2023	9/25/2023	George				purple1
15	1.1.13 Faring manufacturing method research	task	9/4/2023	10/19/2023	Denial				blue2
16	1.1.14 GoldenFest	milestone	9/20/2023	9/26/2023					blue2
17	1.1.15 Interview begin	milestone	9/12/2023	9/12/2023					blue2
18	1.1.16 Expo	task	9/22/2023	9/14/2023					red1
19	1.1.17 Prototype strain gauge sensing	task	9/18/2023	9/26/2023	Kyle	1.1.8			green2
20	1.1.18 Prototype bench	task	9/18/2023	10/27/2023	Serjey	1.1.7			blue1
21	1.1.19 SCU Schematics	task	9/18/2023	10/30/2023	Colton	1.1.9			yellow1
22	1.1.20 PDU Schematics	task	9/18/2023	10/30/2023	Colton	1.1.10			yellow1
23	1.1.21 Sprocket design review as team	task	9/23/2023	10/12/2023	Denial	1.1.6			blue2
24	1.1.22 Strain gauge sensing PCB design	task	9/26/2023	10/20/2023	Kyle	1.1.17			green2
25	1.1.23 Build the top pads in Fusion360	task	9/26/2023	10/2/2023	George	1.1.14,1.1.11			purple1
26	1.1.24 Team performance review 1	milestone	9/27/2023	9/27/2023					blue2
27	1.1.25 All recruits added	milestone	9/30/2023	9/30/2023					blue2
28	1.1.26 Final recruit LTM	milestone	10/2/2023	10/2/2023					blue2
29	1.1.27 Order and install sprocket adapter to motor	task	10/2/2023	10/29/2023	Denial	1.1.21			blue2
30	1.1.28 Design bring prototype for axle, tank, nose	task	10/3/2023	10/30/2023	Denial	1.1.13			blue2

**Business**

Responsible for communicating with sponsors, along with creating and maintaining budgets and other administrative duties.

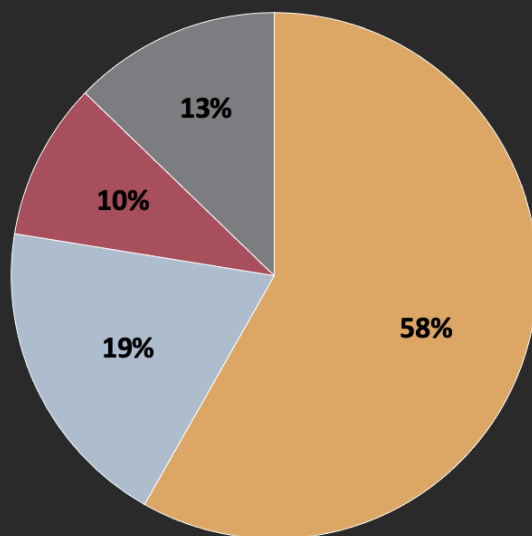
# Sponsorship

With our sponsors' generous support, we can push the limits of electric motorcycles. BOLT provides numerous benefits to our sponsors, including:

1. Advertisement: Your logos will appear on our bike, website, and on our social media
2. Recruitment: Your company will get the opportunity to recruit experienced, skilled, and dedicated individuals from our team
3. Access: You can review our breakthrough research and development ideas.
4. Service: Nurture the next generation of emerging engineers to grow and develop practical and professional skills

Additionally, our sponsors are always welcome to stop by and see our progress in the Ware Lab. Our team leads would be more than happy to arrange a tour. Any support you can provide, either monetary or in-kind, would be greatly appreciated.

## 2023-2024 Budget Projection



At least  
**\$54,800**

Is needed to fund the 2023-2024 projects

■ BOLT VS	\$31,900	■ Dirtbike	\$10,600
■ Other	\$5,300	■ Bus Battery	\$7,000

# Sponsorship Levels

	<i>Diamond</i> \$10,000	<i>Platinum</i> \$5,000	<i>Gold</i> \$2,000	<i>Silver</i> \$1,000	<i>Bronze</i> \$500	<i>Affiliate</i> \$100
Access to sponsor newsletter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Company logo on BOLT website with link	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Thank you post on Instagram	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Company logo on the motorcycle	Extra Large	Large	Medium	Small		
Company logo on team banner	Extra Large	Large	Medium	Small		
Sponsored post on BOLT social media	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Team resume book	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Company presentations and recruiting opportunities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Custom benefits upon request	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Influence on livery	<input checked="" type="checkbox"/>					

**We are a 501(c)(3) tax-deductible organization**

## Donation Form

Please visit our [website](#) for full instructions on how to donate.



# A Message From the Team Leadership

Thank you for considering our sponsorship proposal! This team provides one of the most rewarding educational experiences available on campus. Although Virginia Tech and the Joseph Fulton Ware Jr. Advanced Engineering Laboratory provides us with a workspace, the entirety of our budget comes from sponsors and individual donors. Without generous contributions, like yours, our team would not be able to exist. Our team is excited about our next steps to disrupt, innovate, and develop high-performance electric motorcycles. We hope we can partner with your company or organization this year. For monetary donations please see the donation page on our [website](#). For any inquiries or in-kind donations please reach out to one of our Team Leads.

Sincerely,

**Aniruddh Chauhan**  
Senior Team Lead  
[aniruddh2002@vt.edu](mailto:aniruddh2002@vt.edu)

**George Mantakounis**  
Senior Team Lead  
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