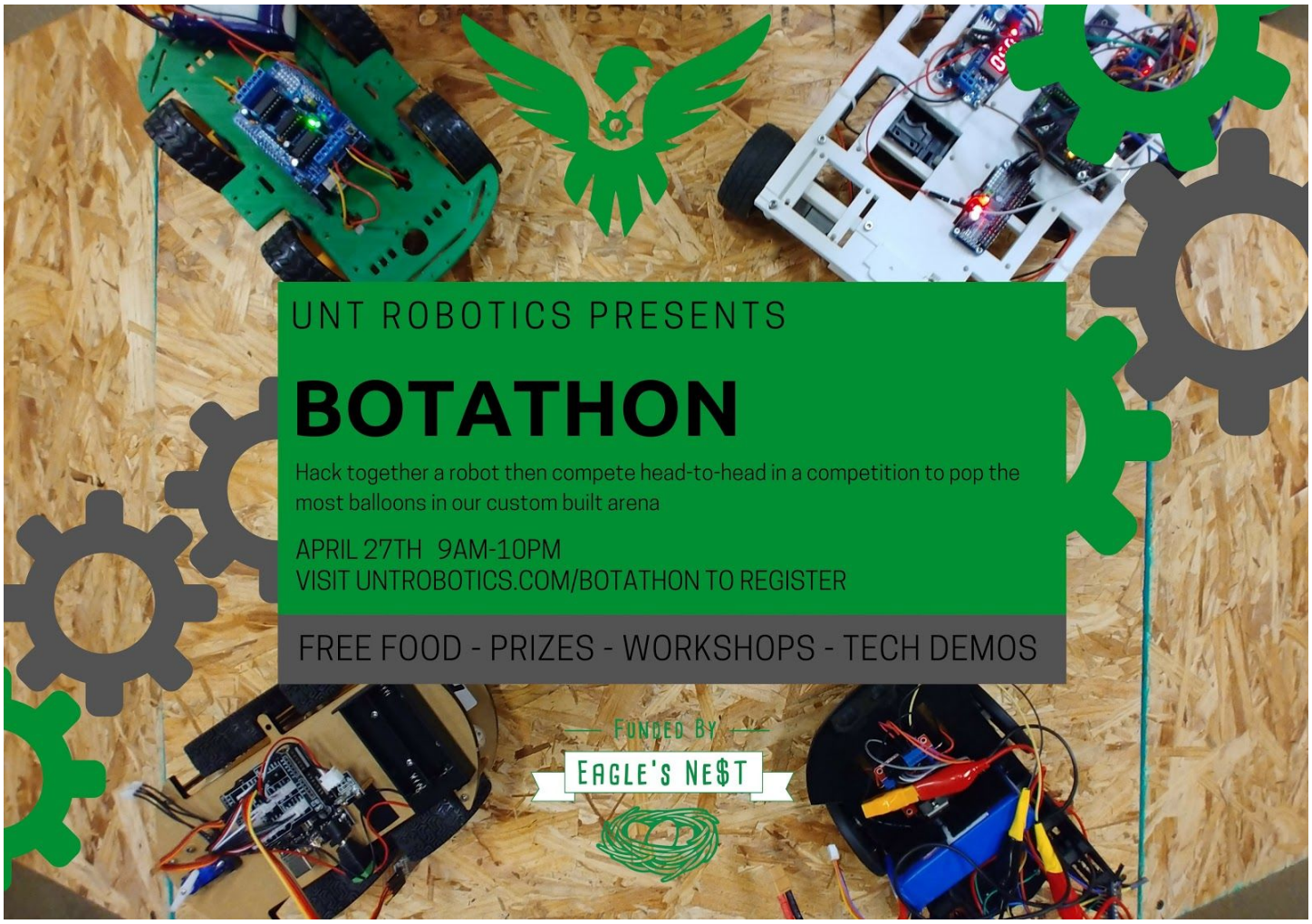


BOTATHON: Season 1

April 27th

Discovery Park

Hosted by UNT Robotics

Sponsored by SGA Eagle's Nest

UNTRobotics.com/Botathon

Packet Version: 3/24/2019

Description

Botathon is UNT's first-ever robotics competition, think hackathon+robots! Participants will have 7 hours to build a robot then compete head to head in a race to pop the most balloons, Mario Kart-style, in our custom built arena. The goal of this event is to give students a chance to learn how to build a robot and compete against their peers. Botathon is free to all UNT students and will feature free food, workshops, tech demos, and prizes!

Schedule

7:30 am	Volunteer Call time
9:00 am	Check-in begins
10:00 am	Competition Rules and Event Overview
10:30 am	Development/Part Check-Out period begins
10:30 am	Workshop: Crash Course in Robotics and Team Building
12:00 pm	lunch
1:00 pm	Demo: IEEE R5 Autonomous robot demo and Q/A
3:00 pm	Resume / Career Workshop
6:00 pm	Dinner
6:30 pm	Competition Begins
9:00 pm	Finals
9:30 pm	Winners announced and prizes distributed

Gameplay and Rules

Definitions

1. **Low level** Any field space underneath the ramps.
2. **High level** Any field space on the ramps.
3. **Suspension** Robots cannot be controlled during the duration of the suspension and must remain idle
4. **Intentional** done on purpose; deliberate (as decided by the referee).

Competition

The event will take place in a 30’ x 12‘ arena. Contestants will have 4 minutes to maneuver their bot across the field and score points by popping their opponents' balloons. Points will be awarded to teams that use their robot to pop balloons located around the field. In addition to the balloons on the field, there will also be balloons attached to your opponent's bots that you can try to pop for additional points. The competition will be double elimination with a winners and losers bracket. Each team is guaranteed at least 2 matches. The top 2 teams from each bracket will compete in the finals round.

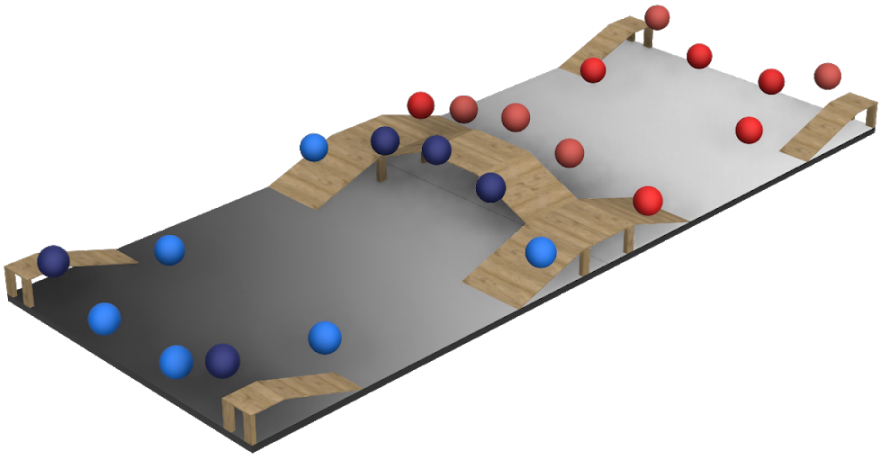
*Repairs mid-game are allowed after the robot has been removed from the arena by a referee.

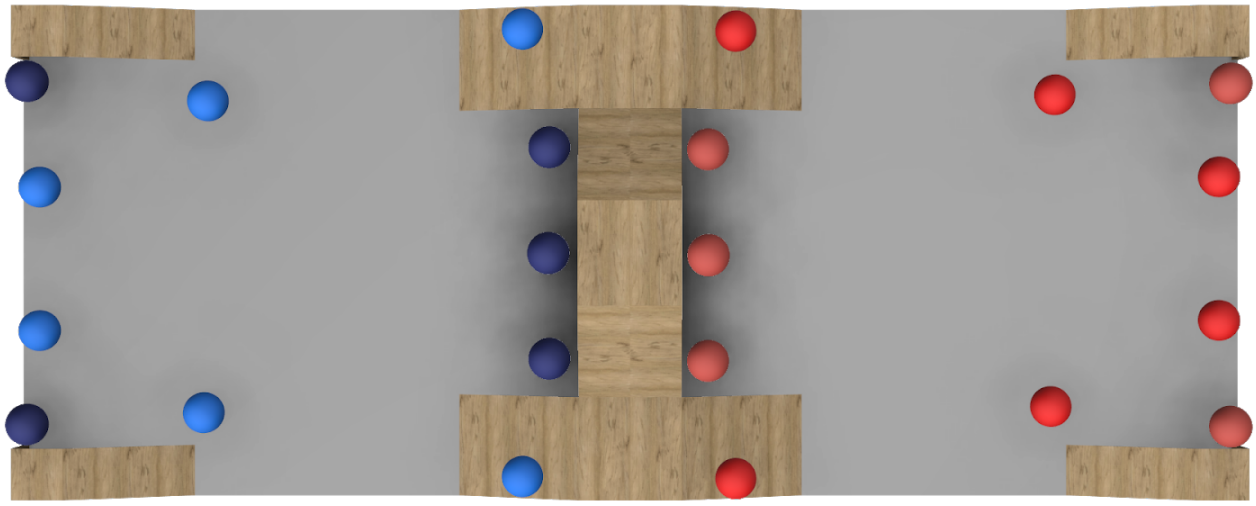
Teams

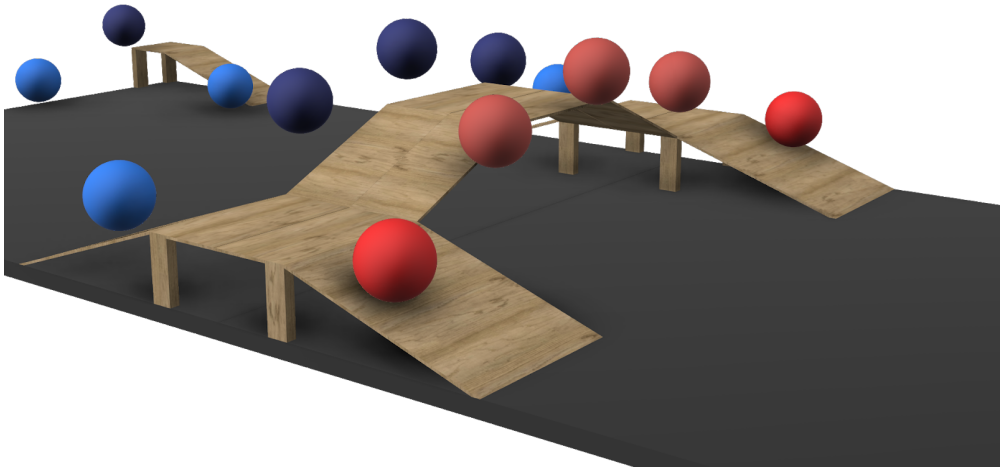
Teams will consist of 4 members. Each team will be given 2 base kits and $500 of in-game currency to buy upgrade parts. Participants are encouraged to form their team prior to the event, but there will be team forming on-site for individuals without a team. There will be mentors to assist teams during the build process, but mentors will not be assigned to a specific team.

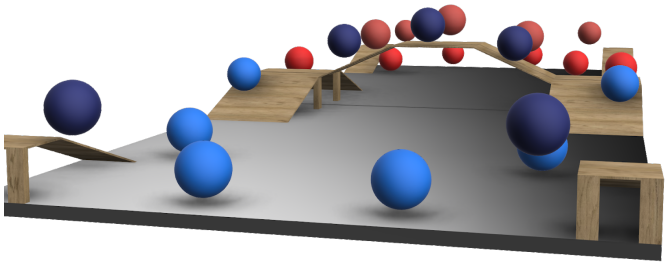
Arena

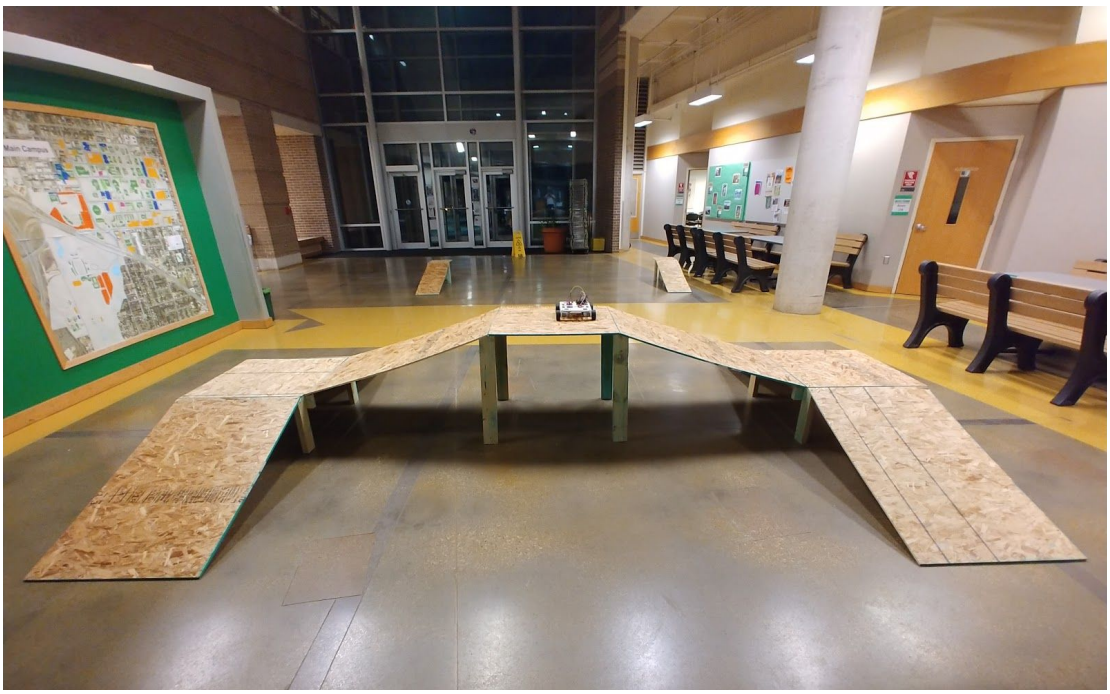
30’ x 12’











Points

Balloons	Color	Point per ballon	Max per tier
Tier 1 (low)	Light Blue/Red	1 pt / each	8 pts
Tier 2 (high)	Dark Blue/Red	2 pt / each	10 pts
Tier 3 (on robots)	Varies	3 pt / each	12 pts
All balloon bonus			5 points

If a team can pop all 17 balloons, they will receive a **5** point bonus.

The maximum amount of points a team can earn per round is **35** points.

Contact

Contact is allowed so long that the robot does not intentionally damage or disable the opponent's robot. If a robot is intentionally damaged mid-game from an opponent's robot, the aggressor will be penalized and the game will pause for 1 minute for the team to fix their bot. Teams are encouraged to build their robots in a way that allows for quick and rapid fixes. Contact is also subject to additional penalties as follows.

Low Level

The robot can not inhibit the movement of an opponent's robot for more than 15 seconds. Referees will verbal tell drivers they need to back off and give them a 5-second warning. Failure to comply will result in a holding penalty.

High Level (on the ramps)

Contact is allowed on the ramps with the same low-level contact timing rules, however, intentionally pushing an opponent off the side will result in a penalty and a 2-minute suspension. This will be monitored by the referees.

Penalties

Penalties	Point Deduction	Suspension
Holding	3	N/A
Pushing opponent of the edge	15	2 minutes
Disabling or Damaging	5	N/A
Driving out of bounds	1	N/A

Bot

Building Constraints

Each teams robot(s) will need to adhere to the following requirements

1. 4 Balloons will need to be mounted to the exterior of the robot(s) via a string. The height from the top of the balloon to the ground must not exceed 1 foot. It is up to your team how you want to mount the balloons, but the mounting points must be within 1 inch of the exterior of the robot.
2. Each robot must fit within a 1 ft. cube before the start of a round and at the end of the round.
3. The robot must not include any form of projectiles, heat elements, lasers, or any other questionable components. Teams will be provided with needles to pop the balloons in the base kit. Other methods of popping balloons are subject to approval from the event coordinator (David Woodward).
4. Your bot must incorporate a large kill switch or button on the top of your bot.

Building Tips

1. 2 BLE Bluetooth modules will be provided in the base kit, use these to control your robot. You can then use the blynk app to control the robot from your phone.
2. Build your robot(s) in a way that makes them easy to repair if your bot gets damaged during gameplay.
3. Ask the mentors (staff) for help, they will not build your robot for you but can provide advice and point you in the right direction.
4. Construct your team with members from multiple disciplines including software, electrical, and mechanical.
5. The more designing you can do prior to the event, the easier your build will go. Put some thought into your team's strategy and how to build robot accordingly.
6. Robots tend to... fall off high edges. Make your design robust enough to survive a nasty fall or two.
7. If you're thinking about 3D printing, do as much printing prior to the event as you can.

Base Kit

Each team will be provided two base kits.

Upgrades

Part of the design challenge is deciding how you and your team will spend your $500 in-game currency. See the table below for available parts and their prices. Parts will be "sold" at a first come first serve basis.

Pre-designing / pre-3D Printing

Prior to the competition (April 27th), teams are allowed and encouraged to pre-design and plan their robot(s). All forms of pre-designing and CADing are allowed such that teams adhere to the following constraints.

1. All assembly must be done on site.
2. 3D Printing parts prior to the competition is allowed and encouraged. Parts may be test-fitted, but may not be assembled prior to the event. Parts will be checked during event check-in.
3. All programming must be done on site, however practicing and becoming with the familiar with the Arduino platform and libraries is encouraged.

This spirit of the competition is teams will build their robot within the 7-hour timeframe provided. Mentors will be onsite to help with design and building the robot.

External Parts

Teams are allowed to bring external parts under the following conditions

1. The total dollar amount of the parts cannot exceed $50.
2. These parts will not count towards your team's upgrade money.
3. The parts must be pre-approved by one of the following committee members or during event check in. Please email a spreadsheet of the parts, their value, and quantity to hello@untrobotics.com.

External Transmitters / Equipment (equipment not mounted on the robot)
These items are allowed and will not be factored into the previously mentioned $50. External equipment will need to be pre-approved by the previously mentioned committee members in advance via email or on site at check-in.

Parts Available

Parts

Base Kit*	Quantity		
Motor	2		https://www.ebay.com/itm/Smart-Car-Tracking-Motor-Smart-Robot-Chassis-Kit-2WD-Ultrasonic-For-Arduino-MCU-/254061600026
Wheels	2		
Arduino	1		
2WD Chassis 1	1		
Caster Wheel	1		
Battery Harness	1		
Motor Controller	1		
AA Battery	4		
Power Switch	1		
BLE Bluetooth Module	1		https://www.amazon.com/DSD-TECH-Bluetooth-Compatible-Arduino/dp/B0762FF6MS/ref=sr_1_5?keywords=BLE+module&qid=1547939918&sr=8-5

*Each team gets 2 base kits

Upgrades		Price (in-game currency)	
Arduino	1	$150	
Raspberry Pi	1	$300	
Servo	1	$50	
Metal Gear Servo	1	$100	

Arduino Servo Shield	1	$30	https://www.banggood.com/UNO-R3-Sensor-Shield-V5-Expansion-Board-For-Arduino-p-954753.html?rmmds=myorder&cur_warehouse=CN
Motor/Wheel	1	$50	
4WD Chassis	1	$100	
Building Materials	1	TBD	
Battery Harness	1	$50	
AA Battery	4	$50	
LED	1	$10	https://www.banggood.com/20Pcs-Three-Colour-RGB-SMD-LED-Module-5050-Full-Color-Pwm-For-Arduino-MCU-p-1058351.html?rmmds=search&cur_warehouse=CN
Ultrasonic Sensor	1	$75	https://randomnerdtutorials.com/complete-guide-for-ultrasonic-sensor-hc-sr04/
3D Printing	30 mins	$75	
3D Printing (prior to the event)	1 Hr	$30	
Various hardware (screws/bolts)		FREE	
Jumper Cables		FREE	
Mini Breadboards		FREE	

Resources Available

1. 3D Printers
    a. 3D printing will cost some of your upgrade budgets, see the upgrades table below for price per minute.
    b. On a first come first serve basis.
    c. Please do as much 3D printing as you can prior to the competition.
    d. There are 3D printers at the factory on main campus and discovery for a small fee, or contact us at hello@untrobotics.com to pre-use some of your $500 upgrade budget.
2. Shop Access
    a. For more advanced parts, Michelle can manufacture **simple** parts using the shop. This is limited to drilling holes and cutting material.
3. Mentors
4. Soldering
    a. Under advisement of David Woodward, Tim Stern, or Eric King.
5. Tools
    a. Wire strippers, screwdrivers, plyers, etc.

Questions

Direct all questions that are not answered in this packet to hello@untrobotics.com.

Staff

David Woodward	Event Coordinator
Nick Tindle	Volunteer Coordinator Referee Food
Juan Ruiz	Check-in Lead Crash-Course Workshop Scoreboard
Eric King	Parts Checkout Oversee 3D Printing
Alex Ferguson	Parts Checkout Head Referee
Sebastian King	Lead R5 Demo Referee
Tim Stern	Safety Officer Arena Reset
Michelle Victoria	Shop Liaison Event PR