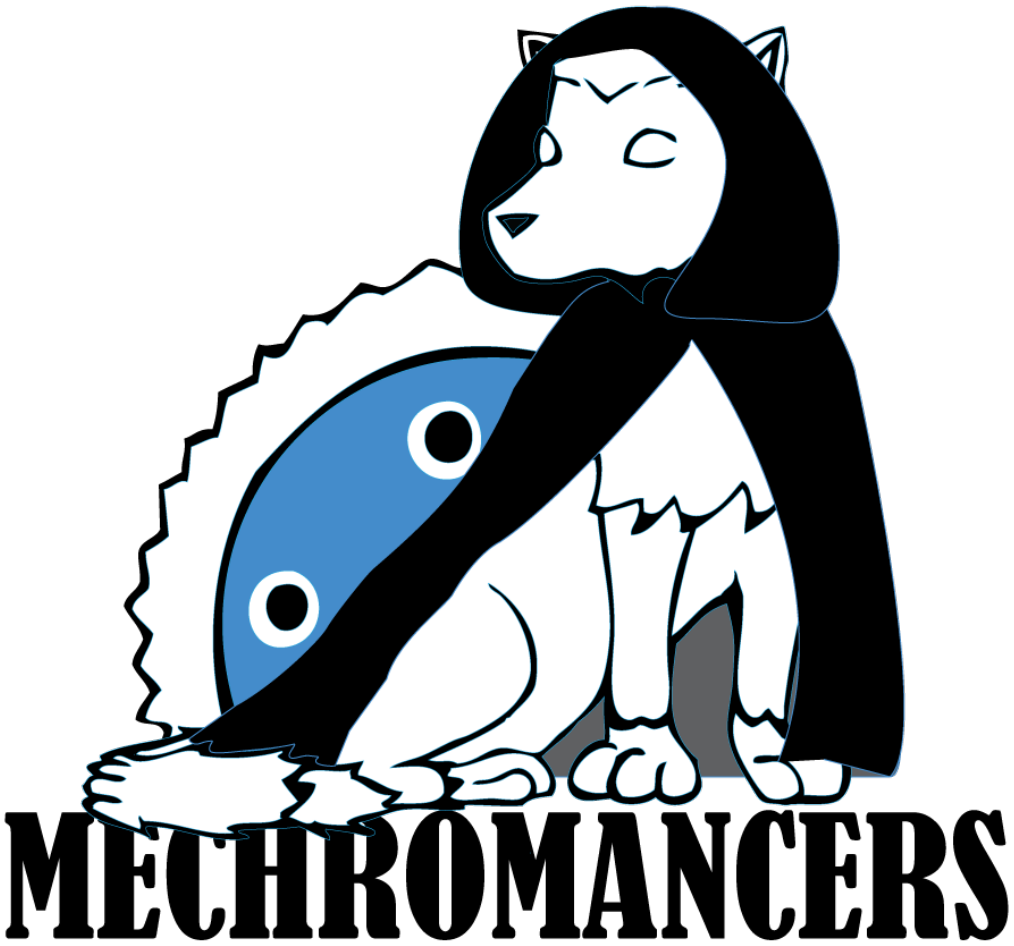

Hagerty High School

4717 Mechromancers

April 18, 2022

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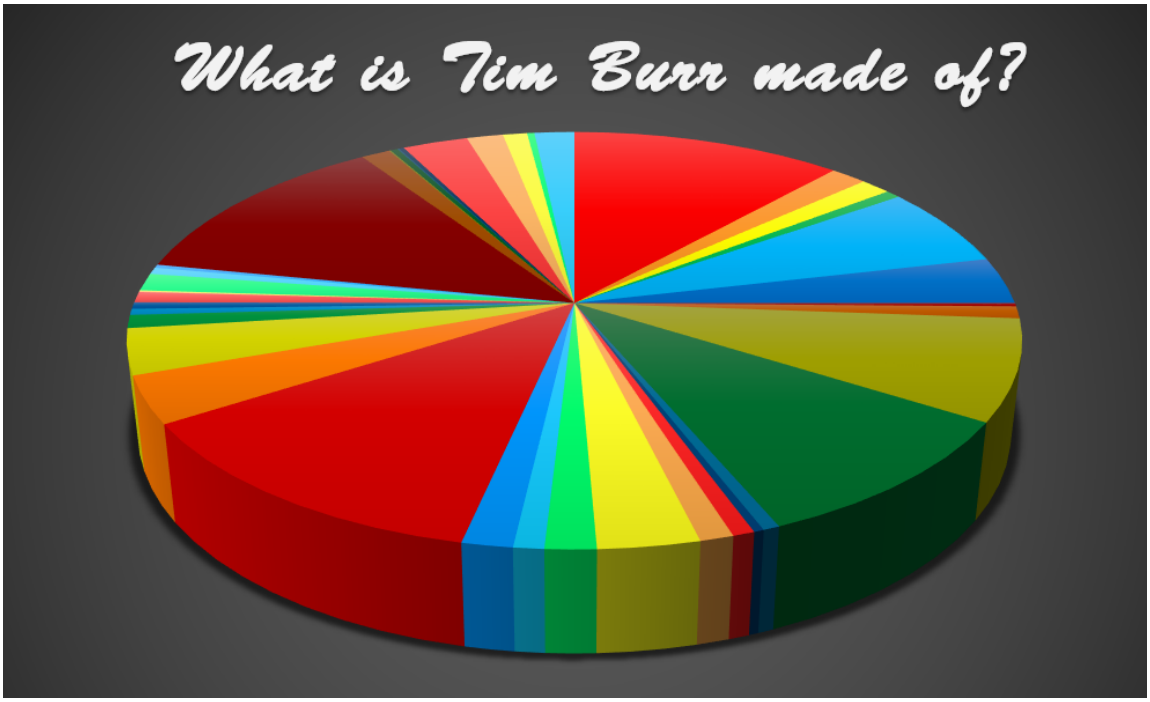
Financial



Mission Statement:

Our mission is...
Encourage STEM and the FIRST principles in the team and the community to develop the next generation of thinkers, creators and innovators. We do this through our commitment to the transformative power of our STEM-oriented outreach program.

Team Overview:

Mechromancers Team Summary

- **Who are we:** We are Mechromancers, FTC Team 4717, a high school robotics team based in Oviedo, Florida. We operate through the Hagerty Robotics Program at Hagerty High School in Seminole County, along with our sister team 4227 Metal Morphosis.
- **Team Members:** We are comprised of eleven members - five boys and six girls - ranging from sophomores to seniors. We are fortunate to have seasoned members who help to guide our newer members. Prospective members are encouraged to attend Hagerty Robotics summer camp to learn more about FIRST's FTC program and to get hands on experience with robotics before they decide to join the team.
- **Team Mentors:** Our team has seven mentors, five of which come from a STEM background. We also have two peer mentors who recently graduated from FTC and now attend The University of Central Florida. The diversity of our mentors makes them great assets to providing training and guidance for the team. Two were previous FIRST members, we also have **skilled professionals like Mr. Harper to assist our team, a machinist and the director of UCF's TI Innovation Lab, a workspace and machine shop,** which the team uses frequently for their builds.

Mechromancers Team History

- **Beginnings:** Mechromancers was originally founded in 2011 as an **all-female team** known as Estrogenius. Over the years, the team has evolved and is now known as the Mechromancers.

Team Impact:

Mechromancers Outreach Activities and Events:

Current Season Outreach: We love to promote FIRST by inspiring and connecting with our community. For our outreach this year, we wanted to focus on making connections with our community, local stem officials, and our team. We run weekly meetings for seven FLL teams, increased from four last season. We also host a recruitment camp for our students interested in the Hagerty Robotics program.

Plans for Future Outreach: We are excited about our Outreach opportunities for the remainder of the season, as our calendar is filling up quickly! We hope to organize more Outreach opportunities where we can demo our past roobts, building interest in STEM.

SWOT Analysis:

Analysis of Strengths, Weaknesses, Opportunities, Threats:

Strengths:

- **Diverse group of students** - bring a variety of backgrounds and interests to the team
- **Extensive Use of CAD** - Almost all parts of the robot were created in the Onshape CAD software and built from raw materials. In Onshape, movements are simulated using articulating joints, family tables are used to create libraries of similar parts, skeletons used for the top-down design, also all models are fully parameterized.
- **Organization** - We decided to keep our team organized through job specialization, breaking up into committees for each aspect of our team. This allows us to work in parallel while still working together as a team. We use a project management app called Trello as well as Band to help our team communicate.
- **Custom Parts** - We used 3D printing as well as the laser cutter and machine shop at the University of Central Florida's Innovation Lab to create custom parts for the robot. We work with the director of the lab, Mr. Harper, who is a mentor for the team.
- **Source Code Control** - We use Github to easily edit and share the code between programmers. This also allows us to track changes in the code and fix past errors.
- **Use of LaTeX** - used LaTeXtypesetting language and Overleaf.com to create an engineering notebook that can be easily edited and formatted.

Weaknesses:

- Large Team - it can be hard to come to a consensus when a decision needs to be made.

- Onshape and Programming Knowledge - While the team is working to train new members in CAD and Programming, we currently only have a few students who are fully trained.

Opportunities:

- Location - there are a **large number of STEM based organizations in Central Florida that we could reach out to for additional mentorship**
- Promote FIRST - expansion of our Outreach program to include more **mentoring of youth either through after-school or summer camp opportunities**

Threats

- Loss of sponsors/grants - would make it hard for our team to financially support itself
- Graduating seniors - losing team cohesion due to graduation of members

Action Plan:

Expand Outreach Opportunities: Reach out to additional schools in Seminole County to provide mentorship for current robotics clubs/FLL teams and push to start an after-school robotics club at our local elementary school.

Focused Technical Training: Continue to provide **technical training in areas such as PTC Onshape and Programming** during the FTC season and offer specialized training with current and/or new mentors during the off-season/over the summer with the goal of **encouraging all members to become familiar with both CAD and Programming.**

Engage Local STEM Community: Look for additional opportunities to connect with local STEM professionals to add to our already amazing pool of volunteer mentors in order to ensure the team **has access to some of the best minds in the business.**

Strengthen Sponsorship Connections: Create (and stick to) a process to better engage our current and future sponsors throughout the FTC season and provide timely updates on the team's progress to not only thank sponsors for their generosity, but to share our enthusiasm for FIRST with them.

Sustainability

In order to ensure that our team **retains its competitive edge** we have a variety of strategies we use to train new members. For example, every year we host a **summer camp** for incoming members to participate in. This camp gives incoming members a taste of FIRST, and over the course of the camp, teams of students build and design robots to compete on the third day! We also have a notebook challenge, because the engineering notebook is an important part of the competition. This is a laid-back, fun camp where students can learn values and skills to use during the season. Additionally, we have created several **committees within our team that graduating members lead**. This allows the graduating members to **pass down all the techniques, skills, and information they have learned over their past participating years to the less experienced members**. This helps to

ensure that we are constantly growing as a team and improving our problem solving abilities. Additionally, at the end of each year we **send personalized thank you letters** to each of our sponsors to maintain a strong relationship with them. In these letters we included the season's successes and achievements to demonstrate what we were able to achieve with their help.

Outreach Sustainability
Statistics through the year
Fall 2021: 356.5 hours
Fall 2021: 101 hours
Average Hours Per Person: 33.4545 hours

Financial Goals and Sponsors:

To ensure we can provide the funds necessary to cover our team's expenditures, we have set many financial goals. Collectively, we strive to accumulate **$5000** during the 2021-2022 season to provide the necessary funds to support our team. We accomplish this goal by obtaining $150 from each member, requiring each member to obtain $100 in donations or sponsorships, and by participating in several fundraising events such as spirit nights. The money we acquire will go towards paying for the goals we have listed below:

- **Travel Goal: $25,000**
  Whenever we stay overnight at hotels or travel out of state for a competition, we incur additional expenses like paying for gas, meals, and hotel rooms. Most of these expenses will be paid by team members as part of the travel fee they must pay in order to go to the competition. We estimate that the total cost of travel to the State, and World Championships will be $25,000, so throughout the competition season we will be charging students travel fees ranging from $100 to $450 if we advance. This year, we qualified for the World Championships, increasing our travel cost goals.

  Current Progress: For the closer events we have participated in that are only 1 hour away, we require members to provide their own transportation; however, we encourage carpooling. For events such as States and Worlds we provide vans and hotel rooms for the participating members and split the total fees among all participating members. We require members to pay for themselves to participate in these events due to the high price tags. Our financial income, consisting of donations and sponsorships, do not cover all of these costs. Therefore, we do our best each year to gain more sponsors for our team in hopes that we will be able to one day pay for these costs. To ensure we keep our sponsors happy to donate to our team each year, we **send them a final update on the seasons events along with a thank you letter for all of their help and encouragement.**

- **Competition Field Goal: $258**
  The field in total costs $480.00. However, this cost is split between our team and our sister team since we will both have full time access to the field. We

thought that the field was an extremely important asset to take into account with our finances. The field allows us to practice our autonomous program and teleop driving skills. Our performance on the field during competition is 50% of our overall score. Therefore, being able to accurately practice and perfect our skills allows us to perform better during the matches. In order to meet this goal we will use the money we have accumulated **from fundraising** for our team.

Current Progress: We have purchased a practice field for our team to use. This has been a very valuable asset to our team. We have used the field almost everyday. In addition, we host scrimmages using the field in the weeks leading up to competitions. This field was also used at the League Championship Hagerty High School Robotics hosted.

- **Competition Fee Goal: $2,500**

  The entry fee for each competition increases with the advancement through the championships. Typically, registration for league meets costs $300 in total, the state championship costs $200, and World's costs $2,000. Therefore, our goal is **representative of the registration fees** for all the competitions we participated in.

  Current Progress: Thus far into the season we have been able to pay for all of our league events from our team account. As we progress through competition levels we use the money we received from our sponsors to help pay the registration costs. Therefore, in order to ensure this money to our team we always send thank you notes with a list of our accomplishments to our sponsors. We truly appreciate their donations and encouragement they provide us with season after season.

- **Hardware Goal: $500**

  Since we have competed in previous seasons, we can reuse parts from our older robot designs in our current robot. This reduces the overall cost of the new hardware we would need to purchase.

  Current Progress: This goal is a priority for us to meet since our robot, Scoopie, is the center of our team. Therefore, our income is first used towards paying for our various hardware expenses. Our income consists of the money we obtain **from membership dues, donations, and sponsorships**. Our robot currently costs $305.66. We have accumulated many of these pieces from previous robot designs meaning that this is not the cost we had to pay for this years new hardware. This season's new hardware cost us a total of $305.66. This means that we set a higher goal than we needed to achieve. This is a good sign for us meaning that we were ready to anticipate spending more money than we needed to. The left over money that we would have contributed to hardware can now be distributed to other areas of financial need such as our Competition fee goals, saved for the future, and hardware needs for the season.

- **Fundraising Goal: $5,000**

  In the beginning of the season we set a goal for each member to raise $100 to help support our team. Since we have 11 members on our team we initially set our fundraising goal to $1,500. However, our fundraising events proved more popular than expected, allowing us to raise our goal to $7,500.

Current Progress: We have accepted several donations from family members of the team as well as local businesses. Another fundraising event we did was over the summer known as Robo-boat, where it was a smaller competition where we had a team make a boat to compete in a fully autonomous race. Our team made it to second place, bringing in $2,000 for our team. More about this specific accomplishment can be found in the outreach section of our notebook. In total we have accumulated $15000 of sponsorships and donations. This means that we have surpassed our fundraising goal for this year!

Even though these goals accumulate to $10,000 more than our overall team goal of $5,000, this goal represents the realistic costs our fundraising activities can provide for us. As previously mentioned, we do not expect our team to be responsible for meeting all of the ideal goals involving travel fees. We feel that since not everyone can participate in each event, then the money we raise as a team should go towards things all team members can enjoy such as our robot. In doing so, we are able to account for this extra amount of money that we as a team are not able to raise. We do, however, do our best to ensure a fair and even spread of our team finances. By this, we mean to say that surplus money we raise past our fundraising goal does go to lowering the overall cost members who travel pay. This money goes towards buying vans for transportation purposes. A reason for the much higher actual fundraising was to prepare for Worlds, which was unexpected at the beginning of the season. For example, we did not buy hotel rooms until after we qualified for the World Championships.

Robot Part List:

Table 1.1: NOTE: Parts list only includes newly purchased parts for 2021-2022 season. Custom parts were made with the help of the UCF Innovation Lab facilities. Other robot parts were reused from past seasons.

Robot Materials	Description	Quantity	Unit Price	TOTAL
Fasteners	Screws robot parts	16	$0.42	$6.85
Wood (1/8 and 1/4 in)	Used to build robot parts	1	$8.37	$20.00
Fasteners	Screw robot parts	34	$0.26	$9.10
Fasteners	Screw robot parts	8	$0.95	$7.62
Flat Washers (100 pack)	Used with fasteners	1	$3.52	$3.52
5mm Round Bearings & 8mm Flange Bearings (30 pack)	Support rotating components	1	$34.99	$34.99
XL Series Timing Belt	Standard Timing Belts	1	$15.16	$15.16
Latex Tubing	Sweeper components	1	$20.05	$12.95
REV Control Hub	Control robot	1	$200.00	$239.00
TOTAL:				**$305.66**

Sponsorships:

Contributor	Contribution	Contributor	Contribution
Hagerty High School	$2000	TLP	$200
Verizon	$750	Lockheed Martin	$2500
Lancelot Familiy	$100	Bargmann Family	$200
Zollman Family	$100	Kristine Kraus	$50
Alaka'ina Foundation	$2000	Belcher Family	$50
Gudanowski Family	$100	Car Wash	$717
TOTAL: $6,249.99			

Outreach Expenses:

Date	Cost	Store	Description
2.13.22	$280.81	Oriental Trading	Assorted Rubber Ducks
2.24.22	$16.59	Amazon	Red Tulle Fabric 6" by 200
2.24.22	$12.99	Amazon	4 pc 5.5x Magnifying Glass Necklace
2.24.22	$14.99	Amazon	5 Pcs Pom-Pom Headwear
2.25.22	$17.97	Amazon	3 pcs Black Felt Top Hats for kids
2.24.22	$8.99	Amazon	1 pc eBoot Black Elastic Spool
2.24.22	$274.95	Oriental Trading	100 pcs Mega Rubber Ducky Asst
2.24.22	$43.74	Oriental Trading	Assorted Rubber Ducks
08.10.22	$2400	First Lego League	FLL Registration
TOTAL: $3071.03			

Outgoing Costs:

Event being spent on	Amount Being Spent
Materials for Laser Cutting, 3D Printing, and new Parts (Hardware)	$305.66
FLL Total Costs (Outreach)	$3071.03
Team Registration and Field Supplies (Other)	$556.17
TOTAL: $3,932.86	

List of Figures