Acumentrics – Fault Line

The ELECOMP Capstone Design Program is a unique program that requires its students to apply the skills that they have been learning throughout their undergraduate studies. It is undoubtedly one of the most, if not the most challenging experience all electrical and computer engineers from the University of Rhode Island must complete that prepares them for their future careers in industry. For a large majority of the capstone designers, their ELECOMP Capstone Program provided them with their first experience working on a large-scale project with real world implications. This was certainly the case for both members of the FaultLine 2022 team, as we were tasked each and every week to think critically about our approach and come up with innovative solutions to our current technical challenges.

Through excellent guidance from our technical directors along with program director Dr. Sunak's passion and attention to detail, we were ultimately successful in overcoming many of the challenges we faced. Overall the experience has been overwhelmingly positive, as we had the opportunity to make many of our own decisions based on the knowledge and skills we have acquired both in and out of the classroom setting. These skills are not limited to technical ones and include schedule assessment and planning, effective communication amongst team members and directors, and leadership development. The ELECOMP Capstone Program has helped us improve as both individuals and engineers as we look to begin our professional careers.

Cambridge Technology

The ELECOMP Capstone Design Program at URI gives engineering students a chance to show off everything they've learned throughout the years. Despite last year being extremely difficult for our class of students, only interacting with each other online in an extremely important year for us, this class was able to bring us back into reality. Our team learned about working together as a collective, picking up extra work and helping out where others were having a hard time, meeting deadlines and problem solving skills. With the assistance of our Technical Directors we have gained skills that would be essential for us to have before going into the real world. We would not have gotten very far without their help, meeting with us as a team weekly and one on one whenever we needed extra help. And having the chance to work with a real engineering company to solve a real-world problem isn't an opportunity that many undergrad students get. So we are forever grateful to Dr. Sunak, Jack, and the technical directors that helped to organize this entire process.

Eagle Pitcher: AM BATS

The ELECOMP Capstone Design program is truly one of the greatest experiences an undergraduate engineering student can have before heading into Industry. Ran by Dr. Harish Sunak this program encapsulates what it means to be an Engineer in the field. Each senior Electrical or Computer Engineering student is paired with a company and a

team to accomplish one goal by the end of the year but more importantly there are so many skills and experiences that are learned throughout.

This program has taught us to be extremely organized, to be meticulous when it comes to documentation, to plan ahead and always be on the lookout for anything that may go wrong. It also created an environment that let us know the importance of deadlines and project management. It gave us the freedom to be creative with the tasks at hand but also have direct guidance from experienced engineers who have been in the field for decades. Having direct communication to engineers, not only from our sponsoring company, but also with Dr. Sunak and the Consultant directors, there was always a mentor available. We were allowed to ask questions and wonder, whether it was about the project, general engineering questions, or about the careers to start once graduated.

At the end of the day, a lesson that was repeated, it was always on us to learn and find the answer or the closest solution to assist in our problems, and that's how one makes this a successful experience. Sometimes it'll be hard with other courses and for some, jobs or internships to pay attention to but putting in maximum effort in your project will allow you to cross through lines never imagined. The growth the AM-BATS team experienced not only in terms of knowing how to handle any issue that arises but in overall technical skills as well is extremely stark and telling of how strong and influential this program is.

General Dynamics Electric Boat – COTS

The GDEB-COTS design project, led by TDs Adam White and Art Viola, provided our team with valuable engineering and non-engineering related experience. Notably, we fielded several key elements from within our educational experience at the University of Rhode Island, notably, electrical engineering theory, PCB design and hardware/software development. This program provided us with a great way to apply what theory we had learned with an application-based approach. Additionally, assistance from Mike Smith, Brenden Smerbeck, Jack Murphy and Doctor Sunak was instrumental in the development of our technical and interpersonal skills. These principles are heavily important in not just engineering, but in any team environment within the workforce. We are very fortunate to have had the opportunity to learn from each of them. Through these past few semesters, our team has learned how to overcome unexpected obstacles as well as adapt to being plunged into a new team environment, working effectively to achieve a common goal. As each of us can testify, the ELECOMP capstone program has been a staple experience and a successful emulation of what it will be like to join the workforce as we progress to the next chapter of our engineering careers.

Individual Testimonials

Michael Marcello: The ELECOMP Capstone Program was an essential part of my education at the University of Rhode Island, and it assisted me in my career development and search. Notably, it paved the way for the groundwork of my understanding of the engineering process. Without this guidance from Professor Sunak, I would have not been

able to properly comprehend the various intricacies of the engineering process. I also gained wise insight from Brenden Smerbeck about various industry practices and standards. If I had any questions about the program's goals, I could always contact Jack Murphy and he would provide me guidance with any communication or administrative related inquiries. Overall, this program equipped me with the necessary skills that I will need to become a successful member of society in my field of study.

Luke Wilson: The many hours spent in the ELECOMP Capstone Program supplied me with an experience that was as fundamentally close to the engineering industry as I've had since I began my student career at the University of Rhode Island. Coming out of my summer internship, I'd believed that I had learned much of what there was to learn in the ELECOMP capstone program but almost immediately I was proven wrong. It helped me to come to a greater understanding of what an extended career in the engineering field might look like and, perhaps more importantly, how to adapt to change. The environments in which I work as I proceed with my career will vary greatly. Whether it's the roles that I play at a specific job or the people or leadership that I interact with, the program that Dr. Sunak has lovingly developed over the years has lent itself to developing its students into individuals capable of taking on these challenges. It was never easy, and at times I felt uncomfortable with the expectations, but it is for those reasons that this experience was so beneficial. Even beyond my own team it felt as though the shared experiences turned our graduating class into a community. For that reason, I'd like to thank Dr. Sunak, Brenden Smerbeck, Mike Smith and Jack Murphy for the immense amount of time and effort they've put into the capstone program, as well as the assistance they've provided over the past two semesters.

General Dynamics Electric Boat – DC Battery

The ELECOMP Capstone Design Program at URI is an excellent opportunity for senior engineering students to gain hands-on experience in the engineering field. While learning in the classroom is essential to succeeding in this field, the knowledge gained while working with a company such as General Dynamics Electric Boat showed us how different problem solving is in the real-world vs on paper. We learned that the insight gained in the classroom does not compare to the real-world experience. While working on this project we have learned how important it is to have passion and urgency thanks to Professor Dr. Sunak. He has motivated not only us but all electrical and computer engineering students that have passed through his capstone program by always teaching by example and showing us how passionate he is about this program. Professor Dr Sunak truly cares. We would also like to thank our technical directors for always being there to help us overcome obstacles with support and encouragement. Overall, we feel this program was a great experience, and a great way to end our college careers.

Hexagon Manufacturing Intelligence:

This project, Smart Process Planning for Inspection, has been excellent experience for us. We had an interdisciplinary team, joining the computer Engineers and Industrial

Systems Engineers together! Being involved in a team who has different backgrounds and learning from each other was beneficial to prepare us for real industry. This past year has had a couple of challenges, including losing a teammate, losing not one but two technical directors, and having a COVID exposure scare. However, special thanks to, Manbir Sodhi, for joining our team as a Technical Director and guiding us throughout the process.

Throughout our time, we've met so many Hexagon Manufacturing Intelligence- Rhode Island members of the workforce located at the North Kingstown Headquarters. We overcame many obstacles thanks to them and appreciate the time they took to come down to the URI Metrology Lab. We thank them for making this project possible within the ELECOMP Capstone Program. As we approach the end of our new beginning, we learned many unique skills that we will carry on and perspectives in collaborating within such a large organization!

Hollands LLC. / Volvo

The Volvo 240 project started as a passion project by one of our team members. During the initial stages of Capstone, Dr. Sunak suggested that it would be a great project to include in the course. A student led Capstone project is not a yearly occurrence, but as a team we are honored to have been given the opportunity. It involved an incredible amount of planning, self-discipline, cooperation, communication, and teamwork. We would argue that these are the core concepts that Capstone is trying to convey. A year ago, we had an idea, redesign the Volvo 240 electrical system using a CAN bus. As a team we had no prior experience designing this type of system. Armed with the support of Dr. Sunak, Mike Smith, Brenden Smerbeck and the University of Rhode Island. We have achieved what we set out to accomplish. The Volvo 240 team would like to thank everyone involved in this process. To future students: Embrace the opportunity afforded by Capstone. There is no better chance to hone your technical abilities and prepare for the challenges ahead.

Cameron Major:
The impact the Volvo 240 project and the URI Capstone program have had on my life and career has been truly incredible. Having such an interesting project to work on week in and week out has been the highlight of my senior year, and the knowledge I have gained throughout the process led to my hiring upon graduation for my first position in the engineering field. I am beyond thankful for the idea, inspiration, and leadership provided by Jamie Hollands. As the only student led project, our group faced unique questions and challenges throughout the year. We were able to successfully navigate these obstacles due in large part to his dedication and passion for this project. At the beginning of the semester, while looking for interested students to join the project, Jamie told us that this project would require finding answers to questions that he didn't know existed yet. There was a lot of research, and a lot of trial and error that led to our successful year. Jamie was never daunted by the challenge, and never complained about working odd hours to make leaps and bounds forward towards our goals. Next, I would like to thank my other groupmates: Timothy King II and Spencer Kubicki. As the three ELE students on the project, we spent many hours this semester running into and through the various technical

issues that arose. All of us were forced to become experts on various parts and operations of the car, and Tim and Spencer could not have done a better job of meeting each task with excitement and persistence to make it happen. Working with the two of them was a pleasure, and made my hours spent in the capstone lab an experience that I was able to look forward to each week.

Finally, I'd like to thank our Technical Directors: Mike Smith and Brenden Smerbeck. Their knowledge and passion were immeasurably valuable to our project. To put it plainly, it's hard to imagine this project finding the success it did without Mike and Brenden available to answer any and every question that we had. They allowed us to tackle the project the way we wanted, and that freedom allowed us to grow as engineers throughout the year. And when that freedom would occasionally lead us down the wrong path on a circuit design or anything of the sort, they were always there to steer us back onto the right track. There was not a single time during the course of this project where we felt left to figure out a problem on our own.

Jamie Hollands:
When Dr. Sunak approached me and asked if I wanted to include one of my projects in Capstone, I was ecstatic. Outside of my love for Volvos, there is an even greater reason that this project has meant so much to me. In 2016 after returning from a deployment I decided that I wanted to purchase a Volvo 240. I waited for 6 months before the one I truly wanted became available. A copper-colored coupe, sitting in the woods in New Bern, North Carolina. She earned the name Penny. I had no experience working on cars, but the process of getting her working inspired me to go back to school to pursue an engineering degree. In 2018 I was accepted to URI as "wanting engineering" and told that the process would take me at least 5 years to complete. 4 years later, I am graduating because of the same car that brought me here in the first place. I have placed an incredible amount of importance on this Capstone project. I learned some much from the people around me in Capstone, especially my brilliant team members. Mike Smith and Brenden Smerbeck always helped me understand difficult topics and directly impacted my skills as an engineer. Closing this demanding chapter of my life in such a cyclical way is poetic and I will never forget it. Thank you, Dr. Sunak, for the Capstone experience and for giving me this opportunity.

Spencer Kubicki:
As an immigrant to this country, I've had to deal with various hurdles in my life. I have been unable to experience what a true full-time job was like without a green card. Coupling that with the recent pandemic, I've been spending the last few years searching for my purpose, questioning whether I was prepared to undertake what was required of me when I started working in the industry. Before the beginning of this school year, we were all given a list of different exciting projects that we would potentially get to work on, including the opportunity to work on a student run project. The idea sounded daunting, and I wasn't sure if I was confident enough to work on a project from the ground up, but I decided to express my interest in it, as it was a really interesting concept. Two semesters later, we have exceeded all expectations, and I have gained so much experience with working on a real, practical project. Through the help of this program, my colleagues, my

technical directors and Dr. Sunak, I feel much more confident, and much more excited to work come graduation. I owe my success to them.

Timothy King II:
Throughout life I have often found myself solving problems in hands-on applications, often by trial and error. Learning to make automotive repairs has repeatedly proven to be an important skill, and making modifications to improve a vehicle always comes with a lasting and satisfying result. The Volvo 240 Modernization Capstone Project has been a similar source of knowledge and enjoyment. Every part of the process was fun and rewarding. It was these strong feelings about simply working on cars that Jamie and I realized we shared almost immediately upon meeting in the summer prior to our Senior year When Jamie told me about his idea for this project and that it would be potentially taking place I saw a tall task, and someone passionate about doing whatever it would take to complete it. I immediately wanted to join him.

Not long after meeting, the project was officially approved and the school year began. Cam and Spencer explained their personal interests and motivations to join the project, and how their skills could be applied to it, to Dr. Sunak and they were approved to form our complete design team. Fully desiring to be a part of this experience resulted in everyone hitting the ground running and not stopping until completion of the project. I would like to thank the entire design team for this specifically, because it is the primary reason why we have achieved much more than even we thought we could. Starting from scratch, our original plan of a working protoboard system was bold, and yet we managed to greatly exceed those plans by producing printed circuit boards with fully functional hardware and software layers. Well done, Cam, Spencer, and Jamie.

What has been achieved this past year would not be possible without the strong support we received throughout the entirety of the process. Thank you to our technical directors Mike Smith and Brenden Smerbeck for granting us your technical knowledge and guidance and thank you to Jack Murphy and Dr. Sunak for giving us structure and logistical support. This diverse array of mentors and their openness to a student led project allowed us a unique degree of freedom that encouraged the team to work as hard as needed to produce the best that we can produce. Finally, I would like to give a special thank you to Jamie for dreaming of this project and for bringing it to life. It is a project that has given so much to each of us and that each of us has given so much to. It is the biggest and greatest thing I have yet to be a part of. Although this leg of the adventure has nearly concluded and our goals have been met, I think it is safe to say that none of us will be done working on this anytime soon.

IXBLUE Defense Systems:

The success of the iXblue team could not have been possible without the help and support not only from capstone director Dr. Sunak, but the passion from our technical directors Dan Nugent and Patrick Moran. Their constant help and guidance helped the team not only stay on task but reignite our motivation when the project began to fall behind. Our technical directors not only gave us in house experience at the company location, but

also took time on Tuesday nights to help keep us on track and answer an outstanding questions midweek rather than waiting until fridays or answering via email. With their help the team gained invaluable experience with working professionals in their field, as well as long term team building and cooperation to see a project through to completion. The team not only gained engineering experience, but also proficiency in writing professional reports, and representing ideas in a comprehensive manner.

As computer engineers, the team gained experience working with python coding, specifically using libraries to complete tasks base python is unable to complete. The team also gained experience with creating tkinter applications which allow users to directly interact with code via application rather than using the command console. This information is invaluable because they are specialized skills that may be glossed over in a regular computer science class.

Working during the COVID-19 Pandemic was a challenge during the fall semester because there were many rules and regulations students had to follow to work in the capstone lab per university regulations. This made it difficult to share space with other teams in a limited space. This gave the team experience with working from home and remote connecting with the team to collaborate on a long-term project. With many students getting sick and new regulations being set in place to combat this, the team gained experience in being accommodating and adaptable for any circumstance that may arise. These skills will help the team in future job environments because we may have to change situations in the real world, and still be able to get work done.

Phoenix Electric:

Our team would like to give a special thanks to our Technical Directors Mike Smith and Sandro Silva. Our project could not have gone so far without their support and instruction. Every week Mike Smith would guide our team in the technical aspects of the annunciator project. He would answer any questions which we had from the software side and the hardware side. He also allowed the team's creativity to flourish in the building of the annunciator. He would allow the team to first try to solve issues regarding this project on their own before stepping in to help us out. Sandro Silva's guidance also kept the team on track in terms of design. Since most of the team didn't come with any knowledge of what an annunciator is, he explained all aspects of how it should work. Also since he is the director of engineering at PEC, he taught us how to deliver a product that would be professional and beneficial to the company and their customers. Both technical directors allowed us to use our creativity to expand the project. They were open minded to our suggestions but always kept us on track so that we could achieve and exceed our ABO.

We would also like to thank Dr. Sunak for giving all necessary resources to our team to reach theABO. All our orders would be expedited so as to not cause any delays in the building of theproject. He also always kept up with our team to see if we were meeting our ABO and kept us on course through documentation. By writing all our reports we knew exactly where our project was headed and what is on the schedule for us to complete. He

also encouraged us to make sure we are putting our company first and making our project a priority.

The capstone program is truly unique in the way it gives real work experience to the designers. It also teaches how to professionally work in a team setting. Going to the biomedical engineers' capstone presentations the question arose: how is your project practical to the real world? In our capstone experience all designers worked with a company and every project made an impact. This really drove our team to completing the ABO. Knowing that a company and therefore a customer would one day use our product gave all the more motivation to apply our knowledge and to design a professional product.

Daniel Reyes
The ELECOMP Capstone was a yearlong experience that allowed me to reflect on the knowledge that I have accumulated during my time at URI and apply it. My favorite part of all this was to see the transformation of the project from the original evaluation boards provided to the team back in late September to a second revision of the team's design by the end of it all. I am utterly grateful to have ended up on my first choice project because my three teammates were all talented and really gave their best. The technical directors were also great help and provided an idea of what designing a product would look like within the industry. It was definitely a challenge and learning experience, but it was a rewarding one.

Nataly Karnaukh
At the beginning of Capstone, I was very nervous about designing a whole project from scratch. Even though I had internship experience, I wasn't sure if I had enough practical and technical knowledge to design something. Going through Capstone taught me that I don't need to know or remember everything. Instead, being quick to listen, eager to learn, and being hardworking are enough for success. I also am very grateful for my teammates. Our whole group worked very well together to accomplish many things. I am also grateful for our technical directors. They were always very helpful and responded to every question I had. Overall capstone was a great experience.

Vithavath Vongsay
Coming into the ELECOMP capstone, I did not know what to expect. At first, it was very daunting. The idea of working on a project that I had no prior knowledge of definitely made me nervous. However, with the support of my team members and our technical directors, capstone has helped me grow into a more rounded person and increase my knowledge on engineering. Capstone taught me how to manage my time and that working in a group is very important. Overall, I am glad that this project was my first choice and how capstone turned out.

Pison Technology

The ELECOMP Capstone project has given us a fantastic opportunity to work in a realistic work environment as well as work amongst some extremely intelligent and gifted engineers that are on the Pison team. Having the opportunity to be mentored by such

people was a wonderful experience. Our Technical Directors at Pison were amazing to work with; always happy to help and assist with any problems or issues we may come up with, as well as productively guiding us to a solution to the issue. Dr. Sunak's passion for this program shows in his day-to-day efforts to ensure every single student gets the most out of the ELECOMP capstone program. We are truly grateful to our TD's, Dr. Sunak, and other peers that have helped us along this journey and assisted us in reaching our ABO this year.

Rite Solutions

Dr. Sunak's ELECOMP Capstone Program has provided us the best opportunity to apply our engineering skills, in a way that no other course can. The ability to work with a real company, such as Rite Solutions, was an invaluable experience. The Virtual Reality Bridge Simulator was a project that we were instantly drawn to upon hearing about it, and we are grateful to be able to work on it with the guidance of Thomas Santos, Michael VonGonten, and Akintoye Onikoyi.

While the scope of this project was quite large, our technical directors provided meaningful feedback on a weekly basis and ultimately helped us grow as engineers. This experience was a truly beneficial experience and has done a great job in preparing us for a future career in the engineering field.

Taco Comfort Solutions

The curriculums for Electrical Engineering and Computer Engineering are long, winding, tumultuous roads that move through countless concepts, formulas and minute intricacies, connecting them all. After years of exhibiting understanding through pencil and paper, the ELECOMP Capstone Design Program offers students a fresh, exciting way to connect the dots. It allows students to test their technical competence with real-world projects, guided by engineering professionals that boast decades of experience in the field. Through this program, students are afforded the opportunity to create and develop products and technologies given to them by actual employees of actual engineering companies. Over the course of a full academic year, teams of students are introduced to tools, techniques, software and hardware used in the field. Students meet with their Technical Directors weekly to discuss progress and hardships, and to probe the minds of these engineering professionals. Students learn many aspects of technical writing, as they are required to document and report each step of the process. With all of these components combined, we feel that we've been given a head start, confidence, and an immediate competitive advantage when seeking employment in Electrical and Computer Engineering.

Vicor Corporation:

Throughout this year, we were greeted with constant assistance and guidance from our technical directors. None of this would have been possible without the URI ELECOMP Capstone program, and Professor Sunak. We were finally able to use our years of

knowledge and apply the skills in a professional environment at the company VICOR. The company encouraged us and drove us to share our fervor and ambition into Capstone. For the duration of the year the technical directors assigned to our project were professional, knowledgeable, and great communicators through challenges and questions encountered in the span of the year. They used their knowledge to display an environment of a professional field in engineering where problem solving and thinking divergently are essential to achieve the goal. In the project skills were developed mainly teamwork and communication to meet deadlines and allocate the proper amount of work designated to each designer. For this reason it made us grow closer as a team and practice our professionalism. Reports and updates were sent regularly to our technical directors with updated bestracks and roadmaps to ensure the target requirements would be met or needed to be pushed back due to delay. To sum up capstone and our company VICOR it helped us become better engineers, communicators, and individuals ready to enter the professional world. Our thanks go to our Technical Directors Al Binder, Nathan shake, Daniel Hartnett and to Professor Sunak for giving our team the opportunity to work towards something incredible and allow us to grow as a people with anticipation to become better problem solvers as engineers.

Voltserver
The ELECOMP Capstone Design Program at URI is a fantastic opportunity for senior engineering students to gain hands-on real-world experience in the engineering field prior to entering the workforce. From the beginning of working on this project it became quite apparent that knowledge gained in the classroom does not compare to practical experience. Our team consists of two electrical engineers and two computer engineers. Each of us worked in a cross disciplinary manner, supporting one another throughout the duration of the project gaining valuable team building skills. Throughout this project we learned more about PCB design and fabrication, soldering, microcontroller configuration, GUI creation, sensor characterization and 3D modeling and printing gaining valuable technical skills as well as life skills which will help us professionally and personally.

Capstone is all about developing a passion and urgency for the engineering field in which we will work in and thanks to this experience, in our future endeavors we will see carry these values with us when solving problems and completing whatever engineering task is before us. The COVID-19 Pandemic proved to be a challenging obstacle for our team as we had several COVID-related setbacks including part shortages and shipping delays which we had to overcome. Overall, the VoltServer team is grateful for the opportunity to have been able to work alongside our technical directors Nate Roth, Camilo Giraldo, and Mike Smith and everyone in the Capstone program.

Kelsey Reed:
Capstone, while quite challenging at times, is quite an invaluable opportunity for real world experience that students should take full advantage of. Not only does it enhance your technical skills that you can put on a resume to stand out as a better hire, but it also improves your soft skills of working on a team and the importance of clear communication. Working on this project helped solidify my passion for custom product design and in addition to improving upon the skills gained through the University of Rhode Island's

curriculum, I learned new ones such as 3D CAD Design and PCB board fabrication. I am ever grateful to my teammates, my technical directors Nate Roth and Camilo Giraldo and my fellow classmates in the Capstone program and Dr. Harish Sunak for this positive learning experience. They all have taught me so much and helped me grow as an engineer while creating memories that I will look back fondly on.

Nicolas Hatzis:
Capstone is not just a class you take your senior year. It is much more. Capstone allowed me to take everything I have learned and use it in a real-world application. When first given the project, I saw it as immensely complex. Over the past year I realized that all my knowledge I gained over the previous years at the University of Rhode Island prepared me to take on this challenge. Lastly, I would like to thank Dr. Harish Sunak for his passion he possesses for Capstone, my team, and my technical directors Nate Roth and Camilo Giraldo for their support and guidance throughout this project.

John Mendez:
Looking back at the experience I had during the duration of the Capstone program, I can easily say that I enjoyed it even though it was difficult and stressful at times. For high school, I attended a vocational high school where they offered several programs such as automotive, culinary, health careers, and pre-engineering. I decided to be part of the four-year pre-engineering program where we learned basic theory such as circuit configuration and put it into practice by using breadboards and developing projects such as a sound amplifier that I still use today. Once I arrived at URI, I missed the hands-on experience. Even though our curriculum has labs for our classes, I still felt like I wanted more hands-on experience and that the material practiced in labs was very short. Capstone gave me the opportunity to gain the hands-on experience that I enjoyed back in high school.

Tobiloba Awoleye:
Capstone for me was definitely a learning experience. It was an emotional roller coaster at times, but it helped me grow in so many areas of my life. It taught me how to be a team player, it gave me an opportunity to gain hands-on experience in a real-world project, and I also learned about embedded systems development. I would like to give a big shout out to my teammates for making it an enjoyable experience and the memories of all the late-night text messages at 3am and all the hours we spent together working in the capstone lab will be cherished forever. I would also like to thank our technical directors Camillo Giraldo and Nate Roth, for always showing up and putting us on the right path towards success. Lastly, I would like to thank Dr Harish Sunak for showing me a new meaning to the word "PASSION". Thank you for always encouraging me to keep moving forward.

XMOS
We, team XMOS, are thankful for the opportunity we received this year to learn and grow. Our technical directors were willing to provide their assistance whenever we would reach any roadblocks. Overall, being part of this program was an incredible experience that we wouldn't be able to get anywhere else. Our group hopes that the work we have completed this semester will fuel more projects for XMOS in the near future.

Zebra Technologies:

ELECOMP Capstone is a massive undertaking for all engineering students, and Team Zebra was no different. Dr. Sunak has created a program that allows students to both prove themselves in a work environment based on the things that they've learned over the course of their education, and work in teams with people they may never have had to before and come together to make something work. The team is grateful that we could be a part of this program and combine our abilities to make something for a company that could potentially have a lot of influence in the working world.

The team as a whole learned many important lessons when working on this project, with a few of the biggest being time management and collaboration. Students are expected to work on their projects with their teams for a large amount of time, and working out what times are best, when we should meet with technical directors, and how to work on capstone projects even while working through other classes is all very important. Likewise, working together is just as important, and taught us communication skills, when to ask questions, and how to spread the work out so that one of us doesn't face a larger workload.

Working on the project itself taught each team member something different, as we all went into it somewhat blind and learned along the way. From coding and GUI development to hardware design and voltage tolerances, the team had to start from scratch and put our heads together and get things to work, though we did have the previous team's progress to work off of. For any future teams working on this project, the team hopes that we have left enough pieces of the puzzle for them to work out what we did and why we did it and continue from where we left off.

The team would like to extend our thanks directly to our technical directors, who did their best to guide us along in the project and help us out when we needed them. While meeting with them was sometimes a challenge, either due to scheduling or COVID concerns, we managed to get a lot done in the time that we had. We appreciate that Zebra offered to give us this project to work on so that we could learn important engineering skills. In closing, we would like to thank Matthew Corvese (ME), Patrick Hegarty (ELE), and, of course, Professor Harish Sunak for putting the whole thing together and giving students like us this opportunity.