Spring 2023 IRL Robotics Programming Engineering Workshops
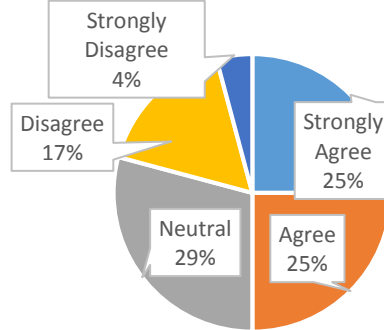(24 responses received out of 30 participants)

## Student Baseline Experiences (Likert Scale)
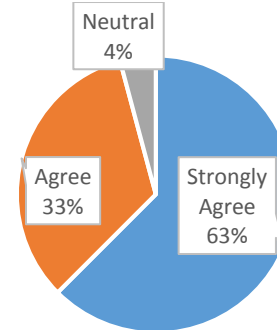
**I gain skills and exposure in the following areas:**

### Robotics
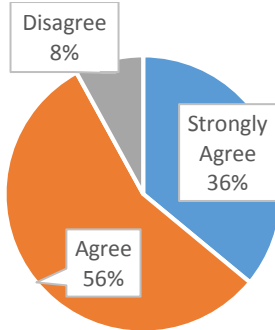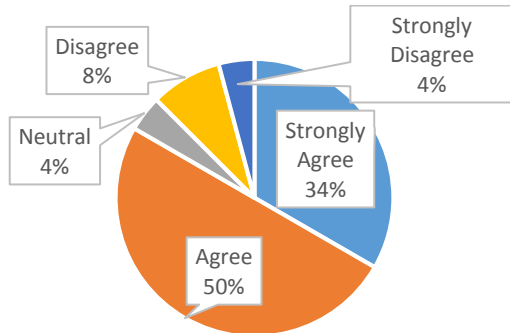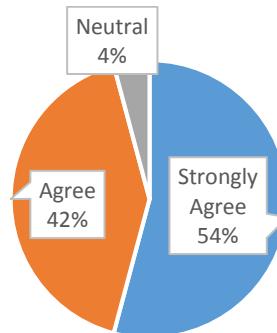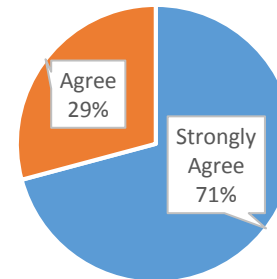


Disagree 8%
Strongly Agree 36%
Agree 56%

### MATLAB



Strongly Disagree 4%
Disagree 17%
Strongly Agree 25%
Neutral 29%
Agree 25%

### Arduino



Neutral 4%
Agree 33%
Strongly Agree 63%

### Programming



Disagree 8%
Strongly Disagree 4%
Neutral 4%
Strongly Agree 34%
Agree 50%

### Sensors



Neutral 4%
Agree 42%
Strongly Agree 54%

### Hands-on Project Experiences



Agree 29%
Strongly Agree 71%

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## Student Baseline Sentiment (Likert Scale)

**I am comfortable embarking on my own project ideas and explorations in the areas of:**

### Robotics
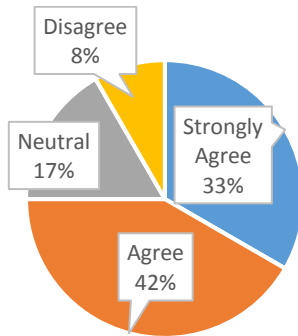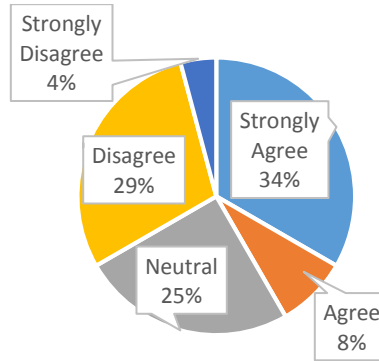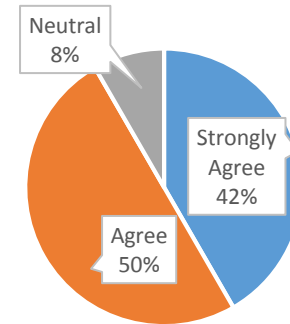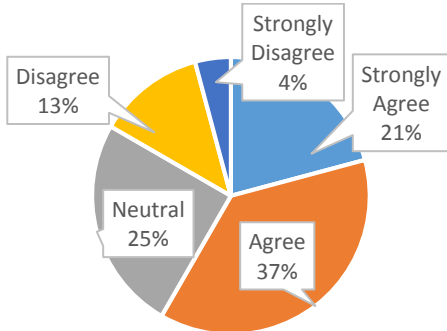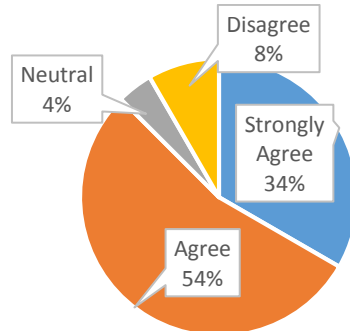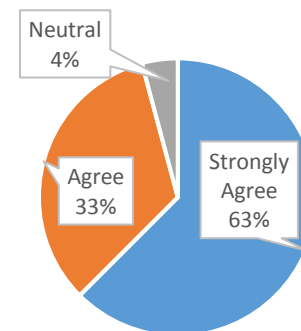
- Disagree 8%
- Neutral 17%
- Strongly Agree 33%
- Agree 42%

### MATLAB

- Strongly Disagree 4%
- Strongly Agree 34%
- Disagree 29%
- Neutral 25%
- Agree 8%

### Arduino

- Neutral 8%
- Strongly Agree 42%
- Agree 50%

### Programming

- Strongly Disagree 4%
- Strongly Agree 21%
- Disagree 13%
- Neutral 25%
- Agree 37%

### Sensors

- Disagree 8%
- Neutral 4%
- Strongly Agree 34%
- Agree 54%

### Hands-on Project Experiences

- Neutral 4%
- Agree 33%
- Strongly Agree 63%

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Spring 2023 IRL Robotics Programming Engineering Workshops
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## Student Baseline Sentiment (Likert Scale) : Continued

**I enjoyed the topics covered in the workshops**

Neutral 13%
Agree 25%
Strongly Agree 62%
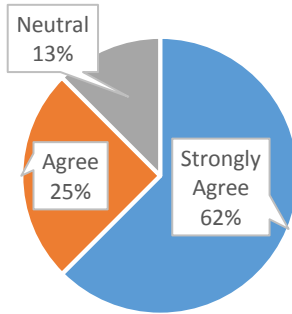
**The workshops were engaging**

Neutral 12%
Agree 21%
Strongly Agree 67%

**I am able to transfer the skills from the workshops to projects I'm interested in working on**

Disagree 8%
Agree 38%
Strongly Agree 54%
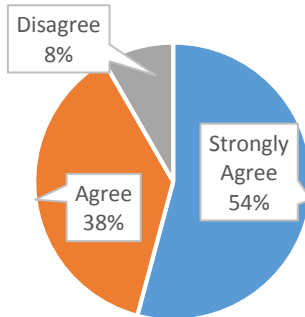
**I feel a stronger sense of engineering identity by participating in hands-on projects**
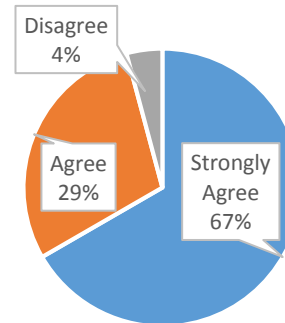
Disagree 4%
Agree 29%
Strongly Agree 67%

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## Student Personal Development (Free Response)

**Do you feel comfortable continuing to grow the skills explored in the workshops? Elaborate.**

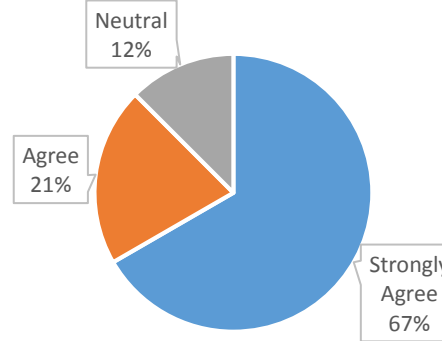*I don't feel comfortable with most of these hardskills such as arduino, matlab, or making certain projects but at least I got a good baseline of these certain topics which I can implore in my future engineering/science classes.

*Yes but also feel like focusing on one or two topics would help more rather than barely skimming over many things

*Yes

*Yes

*Yes however since a lot was split upon the group I feel like I don't fully understand all the parts

*I feel comfortable with the skills I explored at this workshop

*Yes

*Yes, I specifically feel more comfortable growing my skill with the arduino kit, because there's so much to do and learn from it

*Yes, I feel more comfortable to apply the skills I have learned. I will plan for projects over the summer.

*Yes. I think that I am comfortable to grow the many skills that I have learned in the workshops.

*Some of the topics such as the data logger,  I am not that comfortable with, but I like how it was an overview of many things.

*Yes. This workshop helped expose me to the various topics. However, some of the topics were very briefly brushed over, and I wish more time was spent covering the topics, like with MATLAB.

*Yes, these skills will help for future engineering classes

*yes

*Yes I enjoyed the skills taught like arduino and want to continue to use the kits provided to do projects on my own

*Yes, the skills explored in the workshops were a great introduction to many different engineering principles and something that I could now grow from.

*Yes, the workshop inspired me to further my own projects.

*Yes. I would probably get together with friends and work on a project together.

*The only thing that is holding me back in programming experience. It would be helpful if we learned how to combine code for several sensors.

*I really loved the workshops and couldn't wait to start which is why I'd come in early to work on things and get things done with my partner Sam. But, to give you more feedback I do feel comfortable with Arduino now. I get how the board works and what I need to do in order to get things working.  Especially shields I am now  familiar with that concept as well. I'm going to try and teach my own students about them as well so they can learn about all this AMAZING stuff. I plan on revisiting everything that I have gone over in this workshop.

Lastly, with the free kit's and car that you have provided (which I am really grateful for you have no idea how much it means to me) I will be working on that to try and learn as much as I can during my free time. I would also like to add on that I now have Fritzing down so I am able to work with that,

and possibly teach it to other so thank you for teaching me about it.

*Yes I do, I have never done mechatronics, but after this workshop I have been interested in it more, and I would like to get better at it as well.

*I feel comfortable embarking on my own hands on projects, and even continuing the one in the course.

*Yes, this workshop gave a great baseline of where to start and how to develop skills, while also showing where to look for information and how to understand how things work.

*Yes, the skills I learned in this workshop helped me gain exposure on the topics covered. This made me less intimidate in engineering and made me want to continue working more projects

**Did the workshop explore skills required by the internships you are looking for? If not, what topic areas would you have liked to learn?**

*I find the resume and problem solving workshops very valuable because I believe these skills are required in the workshop which people need more of over hard skills such as Arduino, programming, and hardware.

*Yes

*No, would like machine learning

*I wanted to learn some robotic and I did get a beginner approach.

*Yes

*I did gained some new understanding but I felt limited in my skills because I'm very new to engineering

*Yes

*The workshop explored matlab a bit, however I would have like to learn more about data analysis using programs like matlab and python

*Yes, it did explore skills that internships look for.

*Yes, we learned a little about programming, arduino, as well as assembling and working in teams.

*Yes. I would have liked to gone over more coding and programming and MATLAB.

*Yes, the skills would be applicable

*programing

*Yes, although not explicitly stated by companies I think arduino and knowledge of C++ are going to come in handy. Also just the general experience of going through the design process is very helpful

*We did explore skills required by the internships I am looking for such as soldering, basics of coding, sensors and wiring. I would have also liked to learn more about CADing if we had more time. :)

*Yes.

*Yes, there was teamwork, presenting your project and solving problem that came up.

*I think the workshop did a good job at working on different skills. At times it felt a bit rushed, so maybe in the future this could be a biweekly program?

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*I haven't applied to any internships or really looked into them. However, after taking completing this workshop series I can definitely guarantee you that it will definitely help me down the line.

*I think it is required, maybe not the Arduino coding part but Matlab and the problem solving part is definitely required by the internships.

*The workshop helped me explore the skills and topics i have been procrastinating to complete on my own. Because of this i now have a solid base on what i wish to accomplish in the future.

*Yes, tons of skills in such a short time.

*Yes

*yes


**Do you recommend the workshop series be converted into a class you can take for credit? Would you be interested in taking the course?**

*Yes, I recommend this workshop series be converted into a class I can take for credit. This workshop is a great beginner class for those who are interested in engineering or those who want to become an engineer but don't know where to start.

*Yes if it has more structure and helps students transfer

*No

*I think it would be nice to be credit and maybe more time allocated.

*Yes

*Having this converted into a class would be ideal

*Yes

*I wouldn't take the course, because I am a theoretical physics major, however I do think that it could become a course where you would dive deeper into the arduino kit and coding it

*I think this workshop series should be turned into a class, we were too limited with two hours a week.

*Definitely! I would be interested and love if this class could be converted into a class for credit. I think that having a project based class is rare in community college, but is a skill that is crucial to anyone who wants to go into the field of engineering/computer science.

*Yes!

*I would prefer it not to be a course, but rather a club with a certification because it is not part of my degree, but will help on a transfer application

*yes

*Yes and I would take the class

*I would have been very interested in taking this as a class because it was very hands on and engaging. I learned so much from the workshop which were things that were not provided other classes.

*Maybe.

*Yes. I would take the course.

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*I would be interesting in taking this course, but we should still recieve some sort of certification as the course probably won't transfer to other colleges.

*Yes, if this was offered as a class I can guarantee you that I would be one of the first enrolled. Sadly, I wish I could stay in touch with you on a regular basis like a class. But, my schedule conflicts with the 101 class that you are instructing in the fall. However, I will take a class with you at some point if possible even after transferring to UCSD next year.

*I think I would, if the matlab class that is offered at mesa was a pre requisite to this so that we didn't have to spend time on it and do other things, such as build more mechatronics, have bigger projects. I would definitely join if it was something like that.

*yes

*I would 110% recommend this workshop to my peers, which i already have done.

*It would be nice as a class, but it doesn't count towards classes at the university level.

*Yes, I think having it a class will provide more deeper understanding and mastery of the topics.

**If you could redo the workshops, what would you do differently to enhance your own experience?**
*Not sure, the workshop was well defined but intimidating for beginners. I reccomend a workshop on working as a team.

*Work alone. Felt like I had no room to share my ideas in group

*N/A

*not sure

*I think I would spend more time outside learning.

*I would come into this workshop with more knowledge about programming

*Mathlab

*I would watch videos to get more theoretical knowledge on the arduino as a whole and prepare more websites with arduino coding on them for myself

*I would probably practice more outside of the class.

*I would pay more attention to some of the things being said. The class was very fast paced and when I was confused I should have asked for help more.

*Spent more time each week trying to finish that week's lessons. Some topics were brief and thus only covered for one session and not everyone was able to finish or complete all the lessons before starting a new topic.

*I would like to work with more different people

*spend more time on the work in the workshop

*While I liked the activities we did I wish on the beginning we could of had more of a Professor taught lesson for the arduino since I was completely new to the whole idea. The self learning of what the different parts of the breadboard or code do would be easier if we had more time to break things

down

*I would have liked to try to understand more about the different sensors that were available towards the end of the workshop and experimented with them a little to get a broader perspective on these sensors.

*Group with friends, or at least with other dedicated students so I could work with others outside of the scheduled times.

*Be more open minded and come with more ideas.

*I would spend more time working on the project and do some more research on how to complete each assignment.

*If I could redo the workshops I would definitely look more into the libraries and coding portions because I had some trouble with those parts. I started taking my first engineering courses this semester and I have mainly been taking math, science (physics) up until this point. So, I haven't really been exposed to coding or computer science classes even though I really like it, and I really want to learn it. However, I definitely plan on taking some courses here and there some time down the line to further my knowledge in that field. The reason being so is because in today's world you have to know coding/computer science just as good as you know English. If you can code you can practically speak with others and work with many different people such as other engineers, software engineers, project managers, professors, and etc.

*I would just want to have more time to work on the projects and each weekly topics. Other than that it was a very well-planned workshop.

*If i could redo the workshop i wish we had more time to delve into the MATLAB. Due to circumstances i understand that from the presented circumstances that time was short, however i did enjoy the given time.

*n/a

*Meet up with classmates more.

*Dive deeper into learning how to integrate coding into Arduino projects

**Please provide any general feedback you feel appropriate to improve the workshops or comments you would like to make regarding the workshops or instructor.**

*N/A

*Great workshop! I had a lot of fun just wish maybe the sessions were longer or that we did less stuff so we could really learn things well. I think I only learned from the first 2 or three sessions after that it felt so rushed and I really didn't learn anything.

*N/A

*I think it was a little fast paced and each topic felt rushed. I never fully grasped libraries.

*Thank you

*This workshop was very interesting but I felt like there was a big learning curve for those brand new to engineering.

*Thanks for this opportunity

*I think that this was much more fun than my last aruino based workshop, because the professor pushed us to do our own projects, however I would have liked it if the professor emphasized more that she wanted us to pull info from online resources and maybe go over an example of a good online

resource

*Perhaps a bit more time in the workshops.

*I think this workshop was very beneficial! Please make it into a class. The project based environment was so fun and engaging. I loved how it was a low stress environment where we all came together to learn and explore new ideas!

*I wish we had more days covering each topic to learn more and be able to experience more hands on work. This would achievable if this was converting to an actual class!

*It would help to make the lectures shorter so we could use the time to go more in depth on the project

*it was a little too fast

*thank you

*Great workshop and leadership!

*I really enjoyed the engagiveness of this workshop and all the projects we were able to do with the resources provided. In particular, the day where we explored different types of problem solving really stood out to me because it allowed me to understand how problems don't always have to be solved through mechanical means. Overall, it was such a great experience and I would love to take something similar if offered in the future.  :))

*It was great! And I would love to take a second, more advanced, workshop as well if it was offered.

*Not really, the professor was great at explaining all the details accordingly, the professor was also very clear.

*I thought it was a great opportunity and a fun experience. Thank you!

*I have so much to say, and so feedback that I can possibly give you  on so many of the topics and activities that we worked on, and learned about during this workshop series. I will visit you to give you more feedback or we can discuss it over a zoom meeting (or multiple meetings whatever works best). Overall, I really love how rich in information it was. I was constantly working during the workshops and outside of it which was amazing. No time was wasted during this workshop series that's for sure.  You are now a big reason behind why I should probably go to UCSD's Jacob School of Engineering as opposed to SDSU's Program. I feel as though UCSD is way more serious about what they do. Not only that, but the school is ranked very high and it  has many programs and clubs that I am interested in such as the formula racing team, the IEEE Club, and healthlinkucsd club. I follow a lot of their programs so I plan on connecting with some of them if I do end up going to UCSD. However, if I was to go grad school UCSD would definitely be the place for me.

*N/A

*More time on the hands on project would be beneficial for a cleaner final project.

*I think it would benefit having two or more aids to help the professor on tackling student questions and skill workshops like the soldering station.

*I learned a lot in the workshop and I was also exposed to new topics. I just wished the matlab software worked when we were doing the workshops.