



SUSTech

Southern University
of Science and
Technology

COLLEGE OF
ENGINEERING
工学院

2024 Shokz Global Engineer Talent Research and Innovation Summer School

24 JUNE – 2 AUGUST , 2024

The 2024 Shokz Global Engineer Talent Research and Innovation Summer School is a six-week program organized by the Southern University of Science and Technology. This Summer School selectively recruits students from prestigious universities worldwide, with the objective of forming student teams to collaborate on open-ended projects proposed by high-tech firms. These projects encompass real-world production challenges faced by the companies or potential projects aligned with their future planning. Throughout the program, students will engage in a comprehensive process that involves three weeks of methodology learning on the picturesque SUSTech campus, followed by three weeks of further exploration within high-tech firms. The primary aim of the Summer School is to bridge the gap between theoretical coursework and practical engineering practices, offering students immersive experiences while tackling real-world challenges within a global setting.





Open Mindset



Teamwork



Creativity













- Join real-world corporate innovation projects in the Guangdong-Hong Kong-Macao Greater Bay Area(GBA).
- Experience innovation ecosystem and multinational environment of GBA.
- Utilize design thinking for user-centered product development.
- Acquire engineering design skills to find the optimal engineering solution for a defined problem.
- Learn corporate product design skills to articulate market needs and rapidly prototype, considering commercial potential and corporate constrains.
- Apply systematic thinking to understand the trade-offs between local and global optima.



Supervisors & Instructors

			
<p>Prof. Changlong Fu Chair, Department of Mechanical and Energy Engineering SUSTech</p>	<p>Prof. Yongsheng Ma Associate Chair, Department of Mechanical and Energy Engineering SUSTech</p>	<p>Dr. Zhuoxuan Li Postdoc Researcher Stanford Business School</p>	<p>Prof. Yan Wei Teaching Associate Professor, Department of Mechanical and Energy Engineering SUSTech</p>

Academic Mentors from Top Universities and Firms

					
<p>Dr. Ruan Senior Director @ Ping An Technology</p>	<p>Dr. Chen CDC Consultant @Tencent</p>	<p>Mr. Dong Serial Entrepreneur, Angel Investor Senior Entrepreneur Mentor</p>	<p>Ms. Gu Series Entrepreneur CEO @ Yunchang Tech</p>	<p>Ms. Zande MIT Mechanical Eng Ph.D. Candidate @ MIT</p>	<p>Dr. Wu MIT Mechanical Eng Industry Manager @ Mathworks</p>
					
<p>Dr. Qiao, Media Lab @MIT</p>	<p>Dr. Jin MIT Chemical Eng Ph.D. Candidate @ MIT</p>	<p>Dr. Zhu Dept of Aerospace Engr @Toronto University</p>	<p>Dr. Zhu UIUC Computer Science Tech Lead @ TikTok</p>	<p>Dr. Yu MIT Mechanical Eng Researcher @ Confidential</p>	<p>Dr. Xia MIT Mechanical Eng Researcher @ MIT</p>

Founded in 2004, Shenzhen Shokz CO., Ltd is now a nationally-recognized, high-tech enterprise with independent R&D, design, manufacturing and marketing ability. Shokz is named on the list of National Tech Enterprises recognized by the state government and has won national awards such as the 22nd Chinese Innovation Golden Award and the Chinese Design Silver Award in recent years. After more than a decade of fundamental innovation, Shokz has become the world's leading bone conduction technology and retail company. In the global sector, “Shokz” has been recognized as a world-renowned sports headphones brand. In addition, the company have launched a series of hearing aid products under the business entity “Shokz Hearing”. Based on a deep understanding of mathematics, science, technology, engineering and systems engineering, Shokz remains continuously committed to promoting the progress of the world with technological innovation and making human life better, and will move forward with actively exploring fields like acoustics, wearable devices, medical health, semiconductors, etc., to enable universal access to a free and bright future to everyone. On January 27, 2021, Shokz donated to Southern University of Science and Technology (SUSTech) and the SUSTech School of Engineering, and built the Shokz Science and Education Innovation Center.



60 Countries And Regions

We have expanded our global footprint to over 60 countries and regions. Customers can't hear purchase easily from big channels like Amazon / Bestbuy / MediaMarkt / JD.com etc.



4.7 Customer Review Rating

We've hit an average 4.7 customer review rating on Amazon.



7,000,000 Customers

Totally, our products influence the lives of more than 7 million people worldwide.



2800+ Patents

We own more than 2800, the greatest number of bone conduction patents globally.





We invite potential partners to join our dynamic and continually expanding network.

Our Achievements In the Past Three years

- 60+** Open-ended Projects
- 28** Student Teams
- 200+** Students from 9th Grade - Undergrad - Master's
- 50+** International Mentors
- 30+** High-tech Companies
- 21** Days Intensive Training on Design Thinking and Systematic Thinking



- 20+** Open-ended Projects
- 20** Student Teams
- 150** Students from 9th Grade - Undergrad - Master's
- 30+** International Mentors
- 20+** High-tech Companies
- 21** Days Intensive Training on Design Thinking and Systematic Thinking
- 21** Days Further Exploration in High-tech Firms

2024 Summer School Agenda

		M	T	W	T	F	S	S	1-week project	3-week project	3+3 week project
June	week1	24	25	26	27	28	29	30	Innovation on campus	Problem Definition&Solution Selection Prototyping&User Testing Design Iteration&Final Competition	Select students from 3-week project to participate in the in-depth exploration in high-tech firms for the next three weeks
	week2	1	2	3	4	5	6	7			
July	week3	8	9	10	11	12	13	14			
	week4	15	16	17	18	19	20	21			
	week5	22	23	24	25	26	27	28			
August	week6	29	30	31	1	2	3	4			

2024 Summer School Agenda

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
<p>Ideation</p> <ul style="list-style-type: none"> - Problem Redefinition - Concept Generation - User Research - Brainstorming and Ideation 	<p>Refinement</p> <ul style="list-style-type: none"> - Solution Selection - Rapid Prototyping - Model Testing - Model Optimization 	<p>Improvement & Impression</p> <ul style="list-style-type: none"> - Model Iteration - Resource Integration - Risk Assessment - Final Competition 	<p>Problem Redefinition</p> <ul style="list-style-type: none"> - Commercialization Potential - Corporate-based Constrains 	<p>Refinement</p> <ul style="list-style-type: none"> - With Allocation of Corporate-based Resources 	<p>Implementation</p> <ul style="list-style-type: none"> - Beta Product Development
SUSTech			High Tech Firms		
<p>Three modules offered for the 6-week program</p> <p>Module A: Students attend the activities in Week 1, contribute to the brainstorming and ideation process.</p> <p>Module B: Students experience the 3-week methodology learning journey on SUSTech campus.</p> <p>Module C: Students experience the whole 6-week program with learning of methodology on campus and then continued exploration in firms.</p>					

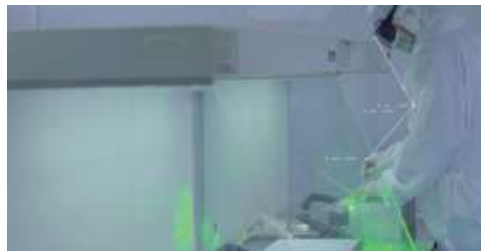
2024 Summer School Agenda

		Problem Solving	Critical Thinking	Open-minded	Collaboration & Communication	Creativity
Week 6		Beta Understand the technical specifications to the manufacturing process and production	Evaluate quality standard and identify areas for improvement	Navigate changes in project scope, design requirements or manufacturing processes	Leverage diverse expertise to address challenge effectively	Apply creative thinking in user-centered design prototyping and testing
Week 5		Identify and address any issues or challenges associated with the existing solutions	Consider various factors, such as feasibility user satisfaction and technical viability	Embrace an iterative and flexible approach to solution re-evaluation	Convey ideas and updates clearly and concisely to technical and non-technical stakeholders	Collaborate with stakeholder from various departments from diverse perspectives
Week 4		Synthesize diverse information sources	Evaluate assumption and questions	Adapt to changing insights, feedback, and evolving project requirements	Disciplines to gain diverse perspectives	Evaluate assumption and question the validity of existing perspectives
Week 3		Resolving customer-centric problems and challenges	Evaluate design decision and identify opportunities	Be adaptable to changing project requirements and user feedback	Collaboration effectively to ensure a holistic approach to design	Think creatively to develop strategies that positively influence user perception and product success
Week 2		Address challenge and obstacles	Evaluate data and user feedback trends and areas for improvement	Be receptive to new ideas, feedback and alternative approaches	work with multidisciplinary teams by clearly correctly refinements, updates and progress to team members	Final innovative solutions
Week 1		Generate ideas	Evaluate ideas objectively	Embrace a variety of perspectives	Embrace a variety of perspectives and be open to unconventional ideas	Think outside the box

3 Weeks in SUSTech



3 Weeks in High-tech Enterprise



Research · Innovation · Entrepreneurship

Southern University of Science and Technology (SUSTech) is a research-oriented public university founded in Shenzhen, China's innovation center.

南方科技大学



Life in the Greater Bay Area (GBA)



Project Requirement

1. Investigate AI manager concepts, characteristics, definitions, functions, and roles.
2. Analyze AI manager applications in task assignment, management, information collection, and collaboration.
3. Identify crucial enterprise scenarios where AI managers are most needed.
4. Analyze core user processes in these scenarios.
5. Compile research materials and insights.
6. Create a comprehensive PowerPoint or document presentation covering the above aspects, research, and conclusions.

Project Background

With the continuous development and application of AI technology, the role of AI in team collaboration and management has become increasingly important. As a new type of manager, artificial intelligence manager can use artificial intelligence technology to optimize task assignment and management, information collection and analysis, communication and collaboration to improve the efficiency and quality of the team, however, there are relatively few products available and they are still in the exploration and discovery stage.



AI manager

AI / 高效 / 拉班舞谱 / 姿态识别



小白

AI+舞蹈
"舞"林秘籍

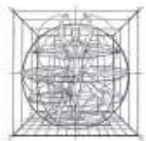


扒舞大神

拉班舞谱科学体系将舞蹈动作元素化



- L = Left side
- C = Centerline
- R = Right side
- 1 = Support column
- 2 = Leg gesture column
- 3 = Body column
- 4 = Arm column
- 5 = Head column



将(x, y, z)分别引申为表示动作在平面、立面与矢状面的空间关系，所有的舞蹈动作都包含在这三个面形成的空间点与空间面当中，即二十面体。



Project Requirement

1. Examine current sports glasses and Shokz's innovations.
2. Identify new features and uses for sports glasses.
3. Design and develop improved sports glasses concepts.
4. Create and test prototype products in relevant sports.



Project Background

Many sports need the cooperation of the eyes, such as skiing, skydiving, cycling and other sports. The existing sports glasses are more innovative in terms of styling, wearing experience, etc. Shokz has invested efforts in headset glasses integration, and AR glasses in the past few years, hoping to develop new functions and uses for sports eyes. The students will take up the research progress and further expand on the new sports glasses in this project. Students will be required to make prototype products.

Past Projects — Innovative Sports Glasses



AR HUD Cycling Glasses Marketing and Prototyping

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Introduction

Cycling is a huge market in China and many cyclists are using bike computers or smartphone apps to help them cycle. However, it is not convenient or safe to use those devices. With the augmented reality heads-up-display or AR HUD cycling glasses, cyclists can focus more on cycling and know their data like speed and heart rate at the same time.

We did two surveys to find the user groups and user needs, one is online questionnaire, and another is field research. We then researched some popular AR display technologies and did market research on many commercial AR glasses. After analyzing the data collected from the surveys and research, we made a prototype that can meet our demand.

Background

Cycling is a huge market and demand in China. In 2018, the market size of cycling glasses reached 5.5 billion RMB, and China had more than 15 million cyclists[1]. Among them, some cyclists use smartphone apps or bike computers to help them monitor their cycling data.

On the other hand, there's a lot of potential danger for cyclists using smartphones or bike computers. Up to 2013, around 77% percent of cyclists would do screen operations on their smartphones while cycling[2]. There would be 10 meters of unknown movement for a high-speed cycling cyclist if eyes were not on the road, which is very dangerous. In the past five years, China has had a total of 9770 bicycle traffic accidents, resulting in a property loss of 23.95 million RMB[3].

Therefore, the augmented reality heads-up-display or AR HUD cycling glasses might be a good product for this situation.

Methods

We did two surveys on cycling and AR HUD cycling glasses, one is online questionnaire, asking cyclists about their cycling preferences and opinions on AR.

Methods

primitive prototypes using existing AR modules from Rapidform Lab or modules we bought, as Fig. 2 shows.

In the meantime with organizing and analyzing the data we collected from two surveys, we researched some popular AR technologies and many AR products in the market and based on them, made our prototype with several iterations.

Survey 1: Online Questionnaires

We distributed and received around 300 questionnaires using Wjx.cn, an online questionnaire website. We asked cyclists about their age, time for single riding, money spent on their bikes and equipment, whether using bike computers or cycling apps, disabilities of bike computers or apps, and what need to know when cycling, etc.

Survey 2: Field Research

We interviewed a bunch of cyclists in Shenzhen Bay Park, 3 sports bike dealers, 3 Tour de France cycling teams, and one member of the Shenzhen Bicycle Association, on their needs and pains when using bike computers or other devices and so on.

Prototyping and Iteration

Methods

primitive prototypes using existing AR modules from Rapidform Lab or modules we bought, as Fig. 2 shows.

Results

It turns out that most of the cyclists are youth with age 18-30, which is consistent with MagicCycling's report[4]. These people and professional sports cyclists are more willing to have AR cycling glasses to help them cycle and they will focus more on speed, distance, time spent, heart rate, and current time data on the AR glasses. Besides, most of them don't like bike computers or cycling apps because those solutions are not convenient or safe. To be clear, cyclists cannot usually find the information they want on the bike computers or the display is bad, and it is dangerous to look down while cycling.

Then we decided our customers are two groups of people. One is beginner cyclists with age 18-30, and mass-market technology enthusiasts, another is professional cyclists needing more professional and convenient devices to help them cycle.

The commercial product research is shown in Table 1. We decided our product should have the ability to truly help with cycling and be relatively cheap so that our product can compete with all those products in the market.

Products	Price	Weight	Material	Color	Case
Avant AR 01	1100	110g	PC	Black	Hard shell
Avant AR 02	1200	110g	PC	Black	Hard shell
Avant AR 03	1300	110g	PC	Black	Hard shell
Avant AR 04	1400	110g	PC	Black	Hard shell
Avant AR 05	1500	110g	PC	Black	Hard shell
Avant AR 06	1600	110g	PC	Black	Hard shell
Avant AR 07	1700	110g	PC	Black	Hard shell
Avant AR 08	1800	110g	PC	Black	Hard shell
Avant AR 09	1900	110g	PC	Black	Hard shell
Avant AR 10	2000	110g	PC	Black	Hard shell

Table 1. Products Research

Our final product prototype is composed of a 3D-printed goggles, a low-power-consumption system-on-chip (SOC), a battery, and an optical waveguide AR module. It can receive data like speed, heart rate, and distance from the smartphone via Bluetooth and visualize those data on the glass, so that cyclist can know their data while keeping their heads up. The overall cost is no more than 1500 RMB.



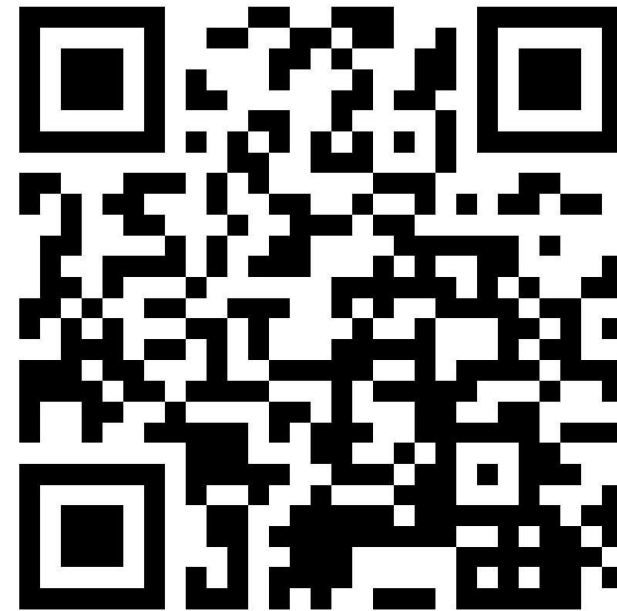
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Tuition Fee	\$2,180 (the tuition fee for the first 3-week project module that covers project materials, social events and excursions.) \$1,000 (the tuition fee for the first 1-week project module that covers project materials, social events and excursions.)
Accommodation	Free of charge, share room with other students
Meals	Out of pocket. The estimated cost for meals is \$15/day
Scholarships	We offer 3 Full Scholarship that covers full tuition fees, a living allowance, full accommodation fees, airfare, and health insurance. 7 Tuition Scholarship that covers tuitions fees.
Application Deadline	February 20th

Sponsored by the Shokz International Exchange Scholarship

Scan the QR code, complete the application form, and upload your resume.

If you encounter difficulties scanning the QR code, you also have the option to submit your resume via email to Mr. Xu at xujx3@mail.sustech.edu.cn.





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