# NEWS FOR A BETTER WORLD

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SHAMOON COLLEGE OF ENGINEERING

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**The SCE Shamoon College of Engineering Newsletter**

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## What's in this Issue?



**Publishers:** The PR and Marketing Communications Department

**Editor:** Talia Gersh

**Editorial staff:** Shay Shabtai, Liron Ohayon, Marina Grinshpon, Debora Korem, Yasmin /samuel

**Language editor:** Naama Dotan

**Graphic design:** Raveh-Peleg Studio

**Photographs:** PR, Kener Productions

**Address:** 56 Bialik Street, Beer Sheba

amart@sce.ac.il | www.sce.ac.il

## MESSAGE FROM THE PRESIDENT

We continue to renew in both research and development, with an emphasis on quality research and teaching and connecting to advanced industries in Israel.

SCE maintains research relationships and student exchange programs with leading institutions in Israel and around the world, enabling our students to experience quality learning environments that enrich them personally and professionally in varied and numerous ways.

The college, as always, allocates extensive resources to the development and enhancement of teaching aids and laboratories, to R&D, enriching the libraries and supporting students by various means, including scholarships.

I wish everyone a good, healthy and productive year, full of teaching, research and development successes.

Sincerely,
**Prof. Semyon Levitsky**
SCE President

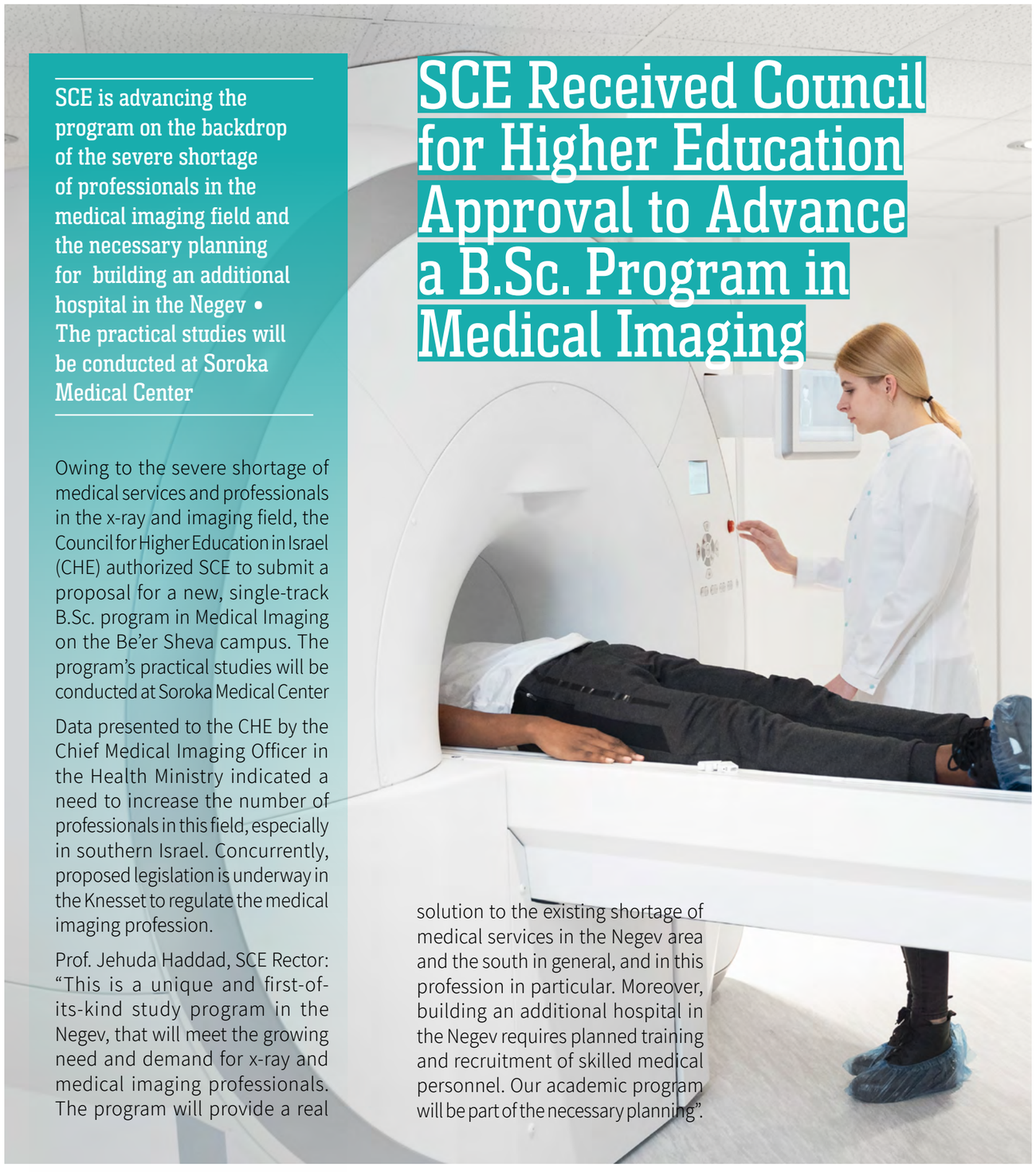
# SCE Received Council for Higher Education Approval to Advance a B.Sc. Program in Medical Imaging

**SCE is advancing the program on the backdrop of the severe shortage of professionals in the medical imaging field and the necessary planning for building an additional hospital in the Negev • The practical studies will be conducted at Soroka Medical Center**

Owing to the severe shortage of medical services and professionals in the x-ray and imaging field, the Council for Higher Education in Israel (CHE) authorized SCE to submit a proposal for a new, single-track B.Sc. program in Medical Imaging on the Be'er Sheva campus. The program's practical studies will be conducted at Soroka Medical Center

Data presented to the CHE by the Chief Medical Imaging Officer in the Health Ministry indicated a need to increase the number of professionals in this field, especially in southern Israel. Concurrently, proposed legislation is underway in the Knesset to regulate the medical imaging profession.

Prof. Jehuda Haddad, SCE Rector: "This is a unique and first-of-its-kind study program in the Negev, that will meet the growing need and demand for x-ray and medical imaging professionals. The program will provide a real solution to the existing shortage of medical services in the Negev area and the south in general, and in this profession in particular. Moreover, building an additional hospital in the Negev requires planned training and recruitment of skilled medical personnel. Our academic program will be part of the necessary planning".



## MESSAGE FROM THE RECTOR

As a resident of the Negev, and as the head of the largest engineering college in Israel, I am proud of the SCE's achievements and of our faculty members who recently led the big technology festival in the south - Tech Fest 23, on the Be'er Sheva campus, and the Smart Engineering 4.0 conference in Ashdod.

I attach great importance to holding these types of events, a lodestone for leading researchers from Israel and around the world, for persons from industry, technology and high-tech, for students and graduates.

At the beginning of the magazine you can already read about the range of events that took place on innovation, technology, artificial intelligence, environment, sustainability and more. Every event was an opportunity to shed light on industry and academia growing in the south, and to position the area as a significant region on the innovation, technology and high-tech map of the State of Israel.

I am happy to announce that the Council for Higher Education authorized the SCE to submit a proposal for a new B.Sc. study program in Medical Imaging. The program will provide a real solution to the existing shortage of medical services in the Negev area and the south in general, and in this profession in particular, and will also be part of the necessary planning for building an additional hospital in the Negev.

I wish all the students, new and continuing, a good and successful year - here, at the SCE.

With warm regards,
**Prof. Jehuda Haddad,**
Rector

SCE Tech Fest 23
Innovation Sustainability Community

# The Big Technology Festival in the South



**The big technology festival held on the Be'er Sheva campus included a range of events on innovation, technology, environment, sustainability and societal topics, with an international hackathon at its center • SCE Rector, Jehuda Haddad: "This is an opportunity to shed light on the commendable face of industry and academia in the south and to place the region on the innovation, technology and high-tech map of the State of Israel"**

SCE Tech Fest 23 – the first and largest technology festival in the south, organized by SCE, spanned over an entire week of events on innovation, technology, environment, sustainability and societal topics. The events, held on the SCE Be'er Sheva campus, were attended by industry personnel, students, persons from academia, and leading researchers in the engineering, science, visual communication and architecture fields.

The events took place in collaboration with international academic institutions, among them Otto-von-Guericke University Magdeburg in Germany, Design School Kolding in Denmark, the Indian Institute of Technology Guwahati (IITG), and Singapore University of Technology and Design (SUTD). The events were open to the general public and included lectures, exhibitions and a large multi-disciplinary hackathon in cooperation with the ICL Group on innovation, environment and sustainability topics, which was the conference peak event.

The aim of the hackathon was to foster innovation and creativity in teamwork on a multidisciplinary project and to promote sustainability ideas.

## The Hackathon

120 students participated in the hackathon - 90 students from all SCE engineering, design and architecture departments, and 30 students from India and Singapore. The participants had to contend with a complex engineering challenge and to find a technological and environmental solution for a problem presented by Yuri Rudin from ICL: to find solutions for recycling or extending the lifetime of the rubber on the conveyer belt used to transport potash.

The hackathon week opened with a lecture delivered by Noam Goldstein, Executive Vice President, Operational Excellence, Innovation & Energy at ICL on "Managing Innovation in an Industrial Organization". The students worked together for five days, accompanied by mentors, faculty members from the various SCE departments, who advised and guided them in developing implementable proposals.

The five groups ranked in the first five places in the preliminary selection stage were announced towards the end of the week, and on the last day presented their hackathon outputs to the panel of judges that included persons from industry and academia, researchers and innovation experts from Israel and abroad. The winners in the top three places were announced at the end of the final selection round and awarded monetary prizes.

The INSIGHT group won first place (Adva Cohen Attia, Eden Kerengal, Stav Politi, Shoval Alkaslasi, Yaakov Svetilitsky, Barsha Amarendra and Bivob Bhuyan – the last two from IITG). The group developed the RoboBelt, a robot that performs control and repair of the conveyor belt while it is moving. The robot, that moves on the top and bottom of the conveyor belt, is equipped with camera sensors

that detect cracks in the belt in their initial stages. After detection the robot cleans the area with a "broom", applies a special glue suitable for the conveyor belt's operating conditions, and finally attaches patches recycled from an old rubber belt to seal the cracks. The second place went to the Innovatigers group, that presented use of the rubber to build bicycle trails, and in the third place – the 4Future group, that presented a solution to extend the lifetime of the rubber using softening substances and various chemical solvents.

Shoval Alkaslasi, a student in the Architecture Department and a member of the group that won first place: "After we advanced to the final stage we understood that there was something special in the robot we created. There were 17 groups here, with excellent proposals, and it was very exciting to win first place. The hackathon was an extraordinary experience. It was different and interesting to join forces with students from other places, with different outlooks regarding the technological world. There was teamwork, in which each person contributed their knowledge. We succeeded in creating friendships and in offering a significant solution to an existing technological challenge".

Noam Goldstein, Executive Vice President, Operational Excellence, Innovation & Energy at ICL: "The climate crisis requires industry to operate differently. We achieve this through increased efficiency, innovation and a transition to sustainable energy. The students will be the ones who will lead industry in the coming years, and therefore we expect them to internalize these values. The challenge presented to them in the hackathon combines the needs of the circular economy with creativity and innovation, similar to the challenges they will face in the future. I thank SCE management and the students for their collaboration and congratulate the winners".

## Final Project Conference and Exhibitions

The Final Project Conference of 4th year students opened on the second day of the festival with a lecture delivered by Prof. Barnabas Wetton from Design School Kolding in Denmark, a world renowned expert who serves as International Innovation Manager and Communication Design Program Manager at Kolding. Prof. Wetton spoke about "human-centered design" and discussed the award winning project with NASA that looked at how to imagine sleeping conditions on the mission to Mars and also how to communicate the underlying value of electric vehicles.

Among the exhibitions that stood out at the conference were the Climate Protest posters prepared by 1st year students in the Visual Communication Department, as well as the exhibition of robots presented by 3rd year students in the Product Planning and Design track and the Robotics track in the Mechanical Engineering Department who presented the outputs of the hackathon on "Robot Service" – autonomous robots that provide an array of services.

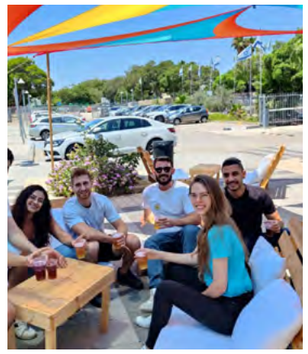
SCE Rector, Prof. Jehuda Haddad: "As a resident of the Negev, and as the head of the largest engineering college in Israel, I attach great importance to holding this conference, a lodestone for leading researchers from Israel and around the world. This is an opportunity to shed light on the commendable face of industry and academia in the south and to place the region on the innovation, technology and high-tech map of the State of Israel"

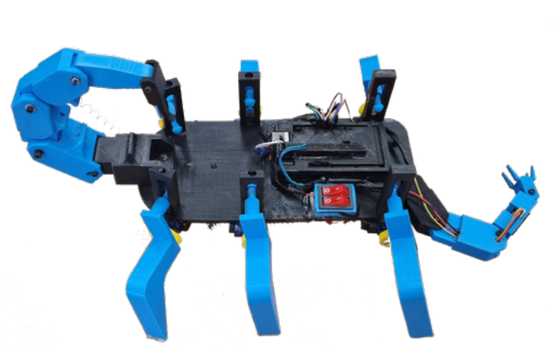
The conference chairpersons, Dr. Gedalya Mazor (head of the Mechanical Engineering Department and the Graduate School) and Prof. Ariella Borg (head of the Chemical Engineering and Green Engineering Department): "In-depth thought and extensive planning were invested in the aim of exposing the students to international industry and academia, and to making innovation and technology topics accessible to the general public".

# The First Time in Ashdod: Smart Engineering 4.0 Week

**The events of this special week, that took place in June, focused on innovation and technology, artificial intelligence and advanced medicine topics, and included students and persons from academia and industry from Israel and abroad • Conference chairperson, Dr. Michal Goldenberg: "The events provide a glimpse into the unique collaboration between persons from academia and industry, which is vital for contending with the challenges of tomorrow"**

SCE 4.0 SMART
Ashdod Engineering Summit





The SCE Ashdod campus initiated the first-of-its-kind festival in the city: "Smart Engineering 4.0 Week".

The festival included events on innovation and technology topics in a world of 3D, artificial intelligence and advanced medicine, with the participation of students, persons from industry and researchers from a wide range of fields - from Israel and abroad.

Smart Engineering Week was conducted in collaboration with local industry and international academic institutions, including Otto-von-Guericke University Magdeburg in Germany. It was open to the general public and included lectures, a presentation of final projects, Visual Communication Department exhibitions, workshops, departmental events, a student happening and much more. Dr. Laura Levin opened the conference with a survey on 3D uses in the 21st century.

A poster exhibition with a social message accompanied the events. The posters are the outputs of the course "Introduction to Design Thinking and Message Communication", taught by Roei Regev, Visual Communication Department academic coordinator, and in collaboration with the Social Involvement Unit in the Dean of Students Office Unit. Students in the course learned how to convey a message based on the understanding of social conventions and local cultural knowledge, through the design of posters promoting local and cultural social issues such as racism, domestic violence, cyberbullying, women's exclusion, cost of living and more. "The idea was to convey a message through limited graphics. Every student expressed their position on a current affairs issue using minimum means, through mediums such as photography, illustration, typography and more", explained Regev.

Noam Lolan, a 1st year student in the Visual Communication Department: "For my project I chose the topic of racism. The message I tried to convey is that despite the difference between us - fundamentally we are all the same. I designed the poster with a focus on typography and use of different languages from all over the world - Hebrew, Arabic, Japanese, Nordic, Hindi, English and more. After researching the topic of languages I combined them in the sentence I created. The idea was to create uniformity out of diversity, and I am happy that I succeeded in conveying the message".

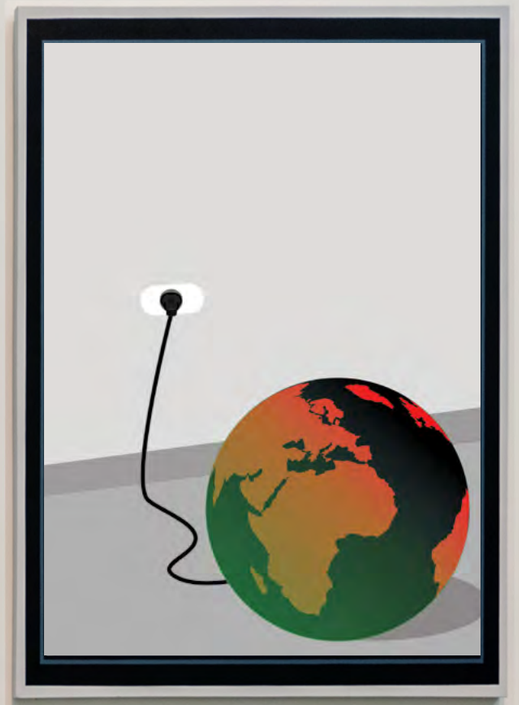
SCE Rector, Prof. Jehuda Haddad: "Smart Engineering Week 4.0 brings something new to the city of Ashdod and to the entire south, as it connects leading persons from academia and industry in Israel and abroad on issues of innovation in a developing world. This event was an opportunity to showcase the academic excellence we foster at the largest engineering college in Israel, and to provide a platform for the high-quality human capital in the city of Ashdod".

The conference chairperson, Dr. Michal Goldenberg, head of the Chemical Engineering Department: "We were happy to host honorable guests on the Ashdod campus from the industry, engineering and technology fields from Israel and abroad. The 'Smart Engineering' conference placed at the forefront burning issues from the worlds of innovation and technology. This is the first-of-its-kind conference in Ashdod, that provides a glimpse into the unique collaboration between persons from academia and industry, which is vital for contending with the challenges of tomorrow. We think this is the beginning of a long-lasting tradition at SCE and want to thank our partners throughout the world, and of course our students, for their investment, hard work and striving for excellence".

Emily Levitan

Adi Levi

Inbal Weissbaum



Stav Madar

# The SCE Climate Protest

**Planet earth enclosed in an hourglass, going up in flames or waiting to be recharged with green - these are some of the graphic images in the posters designed by students in the Visual Communication Department on the subject of the climate protest – "Protest Posters for the Global Climate"**

Towards World Environment Day, marked on June 5, students in the Visual Communication Department on the Be'er Sheva campus designed posters on the climate protest.

The posters are the final product of a teaching process on sustainability and environment - two major issues of global importance with long-term ramifications for the health, wellbeing and quality of life of the future generation - studied in the course "Introduction to Design Thinking and Message Communication", under the guidance of the head of the Visual Communication Department, Nino Biniashvili.

The 20 selected posters were displayed at an exhibition that was open to the general public as part of SCE Tech Fest 23 - the technology festival that took place on the Be'er Sheva campus on June 18-22.

Among the students whose posters were displayed: Adi Levi - who designed a poster of planet earth going up in flames and melting, as the dissolution process reveals more and more waste accumulated on the beaches; Inbal Weissbaum - whose planet earth is enclosed in an hourglass running out of time; Stav Madar - whose poster describes planet earth in black and red colors connected with a cord to an electricity outlet and waiting to recharge and turn green; and Emily Levitan - who displayed two extreme contrasts: a silhouette of a man wearing a gas mask passing through a picture of an ideal landscape, of the world many years ago. She explained: "the combination of these contrasts in one poster aims to create an atmosphere of fear and discomfort, in order to increase awareness about sustainability and environmental issues and to ensure that humanity will not end up in this predicament".

# The Sounds of Music: A "Musical Table" for Special Needs Children

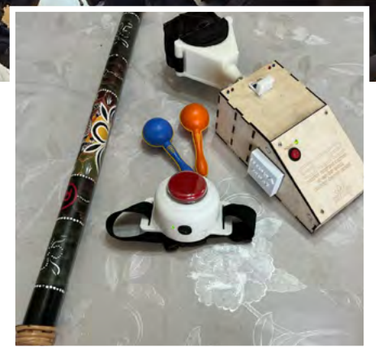
**Or Sofer and Shahar Yehuda, students in the Mechanical Engineering Department, developed an activity table on which children with cerebral palsy and cognitive disabilities can also enjoy playing a musical instrument independently, and donated it to the children at the ADI Negev-Nahalat Eran Rehabilitation Village • "Seeing the children smile", they say, "is a joy that can't be described" • Avi Wortzman, CEO of ADI Negev-Nahalat Eran: "Collaborations of this kind are important for continuing Tikkun Olam"**


Or Sofer and Shahar Yehuda, students in the Mechanical Engineering Department on the Be'er Sheva campus, developed a "musical table" suitable for special needs children and donated it to the ADI Negev-Nahalat Eran Rehabilitation Village.

As part of their final project, under the guidance of Naama Agassi, a faculty member in the Mechanical Engineering Department, the two students developed mechanical mechanisms that interface with musical instruments such that children with cognitive disabilities and cerebral palsy can play musical instruments without assistance.

The project was developed with the support of TOM (Tikkun Olam Makers), a non-profit organization that acts to create technological solutions for persons living with disabilities. The TOM communities in the Negev collaborate with ADI Negev-Nahalat Eran and SCE to create the highest quality sustainable solutions for the challenges facing the Village residents. The prototypes will be adapted and upgraded to real products, and the technical specifications will be distributed free of charge to end users worldwide.

"We set a goal for ourselves to enable children with physical disabilities to play a musical instrument in music class. As part of our preliminary research we visited the Rehabilitation Village, saw the difficulties and challenges, and decided to focus on treatment and physiotherapy through music for children with moderate to severe cognitive disability and cerebral palsy", recounted Or and Shahar. "After mapping the needs and consulting with professionals in the field we understood that the difficulty entailed in playing a musical instrument without assistance may cause the children frustration and even endanger them, because playing a musical instrument requires the extensive attention of the treatment professional, who is simultaneously responsible for several other children. We made sure to plan the musical instrument such that it could be operated simply, and that the children could play it safely and independently, enabling the therapist to turn their attention to managing the lesson more efficiently".

Both the children at the ADI Negev-Nahalat Eran Special Education School and their caregivers were very excited. "Seeing the children smiling and playing with the product we developed was worth everything. It is a joy that can't be described in words", say Or and Shahar.

SCE Rector, Prof. Jehuda Haddad: "A strong society is judged by its care for the weak. The ADI Negev-Nahalat Eran Rehabilitation Village makes a great contribution to society as a whole. They are the spirit and way that connects people and children with disabilities to society. I wish us many more such valuable collaborations".

Avi Wortzman, CEO of the Rehabilitation Village: "Collaborations of this kind are important for continuing Tikkun Olam. Together with SCE we will be able advance and lead new and accessible technologies for all the Village students and residents. A special thanks to Shahar Yehuda and Or Sofer who chose to put their heart into the unique project they created in collaboration with TOM. I would like to thank the entire staff of the special education school and the physiotherapist Dor Nassimian for their continuing tikkun olam and for forging collaborations with SCE. May there be many more".

# How to Choose the Electric Car that Best Meets the Customer's Needs?

**An expert system for ranking and matching an electric car to the customer's specific needs was developed by researchers from the Industrial Engineering and Management Department • The operating principles may also be useful for other applications, such as selecting an energy system or car batteries**

Electric cars have grown popular over the past decade owing to several advantages compared to regular cars. There are dozens of models on the market, in a wide range of prices, specifications and performance levels. Prof. Yossi Hadad, Prof. Baruch Keren and Dr. Dima Alberg, all from the Industrial Engineering and Management Department, the Be'er Sheva campus, developed an expert system to help salespeople and customers choose the electric car that meets the customer's requirements.

The system enables users to rank the various electric cars according to the extent to which they match the customer's specifications, and even to display the number of incompatibilities between the customer's requirements and each type of offered vehicle.

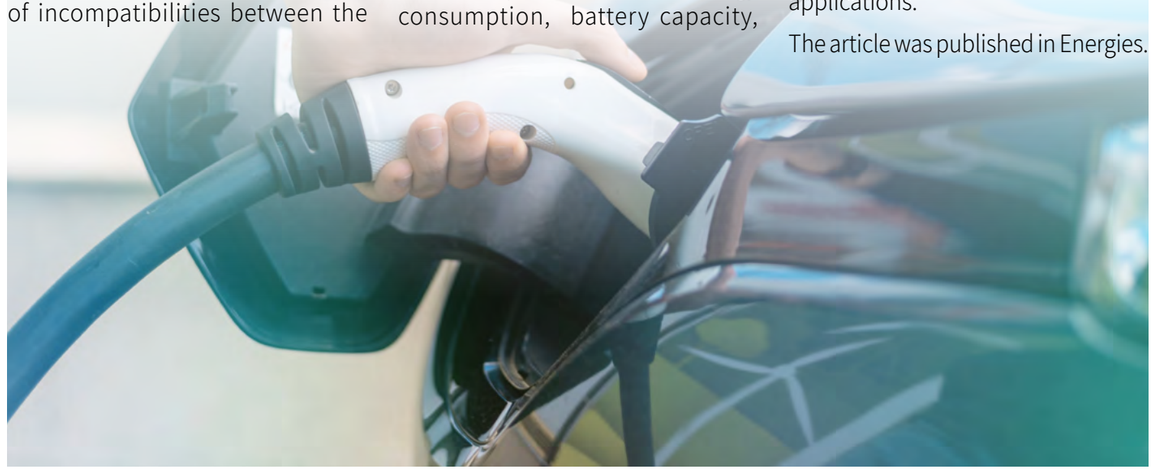
The method is based on the customer's requirements and on the principle of fuzzy sets. The system assigns each criterion a closeness value to the customer's requirements. These closeness values become an input matrix into a TOPSIS ranking model that ranks the electric vehicles according to their closeness values to the specific customer's requirements.

The applicability of the system was demonstrated using a case study of 53 electric cars and 22 different characteristics (criteria) according to which the vehicles specified on the list could be ranked. The criteria included the vehicle price, acceleration, energy consumption, battery capacity, maximum speed, tire size, type of brakes and more.

The case study showed how the expert system that was developed helps customers choose an electric car (out of a set of cars available on the market) that best matches their defined requirements.

The operating principles of the proposed expert system may also be useful for other applications, such as selecting an energy system or car batteries. One important advantage of the system is its ease and simplicity of use. Excel users can apply the method easily, one stage at a time. Python users can activate the code that was developed in order to implement the system and mechanize it for their applications.

The article was published in Energies.



# Another Soccer Saturday? Finding the Right Saturday

**SCE graduates developed a model for finding the optimal day for every soccer game in the Israeli Premier League**

A model that finds the optimal day for a specific soccer game in the Israeli Premier League will apparently be the next big thing in Israeli soccer. The model was developed by Roman Gemer and Tali Krainin, graduates of the Industrial Engineering and Management Department on the Be'er Sheva campus, under the guidance of Dr. Yizhaq Minchuk, a senior lecturer in the department.

Determining the soccer game schedule and assigning soccer game dates is a highly important organizational task that also has economic ramifications for the League in general and the participating teams in particular. The model develop by Gemer, a resident of Eilat, and Krainin, a resident of Karmiel, can help Hapoel Be'er Sheva, Beitar Jerusalem, Maccabi Haifa, or any other team, decide on the optimal date for them to play against the rival team. It is based on analysis of Israeli Soccer Premier League data over the past ten seasons using machine learning.


The model weights parameters such as the teams' table ranking, number of spectators at games, the team's monetary value, type of game - derby or playoff (upper or lower), distance from the team's home stadium and the opposing team's home stadium and more, and recommends the optimal date for a specific Premier League game based on the game data and analysis of the model.

Dr. Yizhaq Minchuk: "This is a high level model that combines a range of fields: sports economics, statistics, machine learning and operations research. Soccer is a popular sport the world over, and also of course in Israel. The model developed by our two talented graduates can provide added value to teams in the Israeli Premier League, that will most certainly find it of interest. The multidisciplinary training we provide our students gives them a significant advantage in model planning and development and in designing innovative solutions in all areas of life – science, health, and even sports".

# A Place to Sleep and a Warm Meal

After watching several television reports on homeless people who died of hypothermia that were broadcast during the corona period, the students Liz Miara and Ofir Ben Aharon developed an application to help the homeless in Israel. The two are students in the Industrial Engineering and Management Department, the Information Systems specialization track, on the Ashdod campus.

The number of homeless people in Israel increased significantly during the corona period and in recent years, and according to the Knesset website currently stands at about 4,200 homeless persons. “The homeless are often transparent; people who are easy for us to overlook, to hop over when walking down the street. Even before discussing a rehabilitation process we must remember that they are often in need of everyday, survival, assistance, in order to pass the night or simply survive”, explains Liz.

The application was developed as Liz and Ofir’s final project, with the guidance and assistance of Dr. Ronit Shmallo, a faculty member in the Industrial Engineering and Management Department on the Ashdod campus, and Yana Sophia, a UX design expert and engineer at the YOUsability Usability Center laboratory. The Center develops interactive technologies, with an emphasis on design that puts the users and their needs at the center of the development process.

Liz and Ofir’s project focused on characterization, analysis and design of an information system for helping homeless people cope with everyday life, and also encourages people to donate and to be socially involved. The system is characterized by creating communication between homeless people and volunteers, businesses and shelters, and in meeting the basic needs of the homeless such as hygiene, clothing and food, in the aim of creating a safe and accessible space for them any time they need help and support.

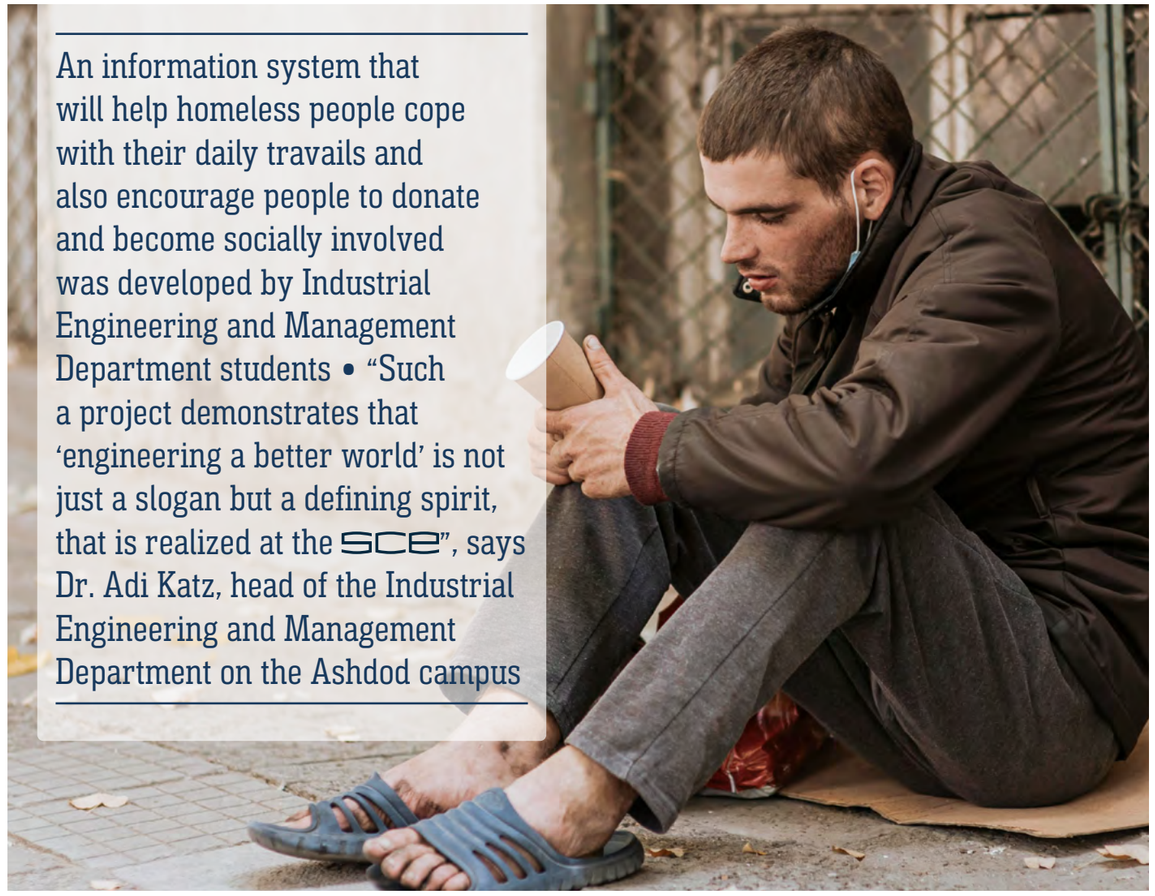
The system can be accessed through a mobile phone or at physical stations, based on the idea of the Moovit stations, that will be placed in central locations on city streets. At these information stations the homeless will be able to request basic products they need to survive on the street and improve their quality of life, and also to receive updates about places that will offer them a place to sleep and a warm meal. Owing to the sensitivity of the target audience, defining the needs of this unique population was based on a case study of a homeless person who succeeded in rehabilitating his life and agreed to maintain contact with the Industrial Engineering and Management Department Usability Center.

The project was carried out as part of the SCE Social Program which helps a range of populations. “As part of the research that we conducted we talked with a former homeless man who was rehabilitated, and we understood that what the homeless lack most is a sympathetic ear, in addition to basic needs such as clothing or food. They will be able to receive these things through the information system. The application also has an option of navigating to a shelter, where a homeless person can spend the night”, says Ofir. Since homeless people are known to social services, the volunteers can also offer them help through this mediating entity. “The system also has an option for receiving help from businesses, such as a free haircut or food coupons”, adds Liz.

“We approached the project with the belief that most people want to donate and help the homeless, but do not know how, where and when to approach them. The information system we developed is a platform that will be convenient for both homeless people and volunteers, a safe virtual space that creates a community connection”, summed up Ofir.

“This type of project demonstrates that ‘engineering for a better world’ is not just a slogan but a defining spirit, that is realized at the SCE. The students adopted a sensitive and empathetic design approach and made contact with a former homeless man, from whom they could gain in-depth understanding of the needs and difficulties of this population”, says Dr. Adi Katz, head of the Industrial Engineering and Management Department and the YOUsability Usability Center.

Liz and Ofir participate in the “Social Angle Final Project” Program headed by the Social Involvement Unit in the Dean of Students Office. The final projects in this program were displayed at the Smart Engineering 4.0 Conference. The program aims to encourage students to choose an engineering final project that contributes to the community and society. The students use the engineering tools they acquired during their studies to create a final project of social value.



An information system that will help homeless people cope with their daily travails and also encourage people to donate and become socially involved was developed by Industrial Engineering and Management Department students • “Such a project demonstrates that ‘engineering a better world’ is not just a slogan but a defining spirit, that is realized at the SCE”, says Dr. Adi Katz, head of the Industrial Engineering and Management Department on the Ashdod campus



# Women Researchers from the Software Engineering Department Partnered in Organizing an International Workshop in Taiwan

## The workshop, at SIGIR 2023, dealt in implicit author characterization from texts for search and retrieval

SIGIR TAIPEI | TAIWAN 2023

IACT'23 מארגני


Marina Litvak


Irina Rabaev


Ricardo Campos


Alípio Mário Jorge


Adam Jatowt

Dr. Marina Litvak and Dr. Irina Rabaev, both from the Industrial Engineering and Management Department on the Be'er Sheva campus, in collaboration with researchers from Portugal and Austria, partnered in organizing the 1st International Workshop on Implicit Author Characterization from Texts for Search and Retrieval.

The workshop was held in conjunction with the International ACM SIGIR 2023 Conference on Research and Development in Information Retrieval that took place last July in Taiwan.

The workshop aimed to bring to the forefront the challenges involved in identifying and extracting from texts implicit information about authors (e.g., human or AI-generated), and using it in information search and retrieval tasks. The IACT workshop provides a common forum to consolidate multidisciplinary efforts and foster discussion to identify the wide ranging parameters related to the task of extracting implicit author-related information from the textual content, and offers, as part of the program, novel tasks and datasets.

Implicit author-related information in the text may include characterizations of a range of variables, among them the author's demographics, geographic location, education, political or social biases in their surroundings, their cultural background, the ethical values they espouse and more. It is also possible to delve into the broad context of the text itself, including details such as when and where it was written, by whom, for what purpose, as well as implicit events that could have impacted the author's writing (e.g. economic repression or war) and their existence in the author's biography.

The information that is accumulated about the author can be used in a range of data retrieval areas, such as improving the understanding of queries, analysis and retrieval of historical documents, analysis of literary works, comparison of numerous search results, identifying AI-generated content, studying the linguistic structure of sentences, as well as studies in the fields of politics and society. Development of these areas may have a significant impact on the ability to perform search and retrieval that will help in acquiring knowledge, understanding contexts, and creating data-based descriptions and rationales.

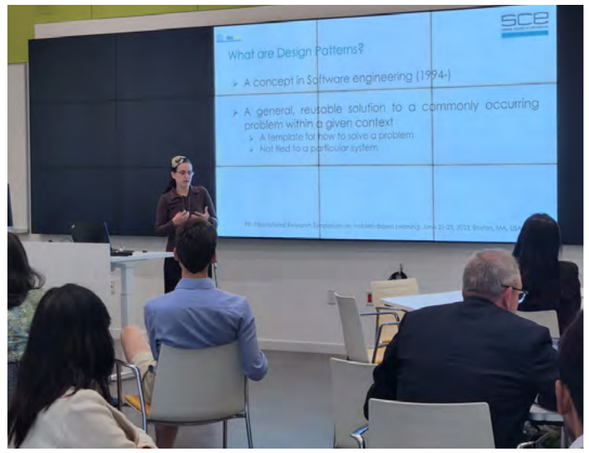
An international ML/NLP Competition on Automatic Classification of Literary Epochs (CoLiE) was held as part of the workshop.

Literary texts reflect language styles, grammatical variations, thoughts, feelings and points of view of different epochs. Classification of the texts to their epoch involves extraction of implicit temporal information embedded in language and allows for retrieval of the historical context and the unique characteristics of every literary epoch.

The competition deals in the automatic identification of the literary epoch of a given text from its writing style: Romanticism (1798-1837), Victorian Literature (1837-1901), Modernism (1900-1945), Postmodernism (1945-2000), and contemporary literature (from 2000).

Groups from all over the world participated in the competition, among them: Italy, Poland, Canada, Japan, Brazil, Austria, India and France. An article summarizing the competition findings will be published in the near future. Vladimir Younkin, an SCE master's degree Software Engineering student, assisted in organizing the competition.

# SCE is on the Map: Women Researchers from the College Participated in the TEE 2023 Conference in Boston




## The conference, on engineering education and changes in the engineering field, took place at Harvard and MIT and included lectures and meetings with researchers from around the world • The SCE researchers presented a teaching approach to design patterns, formulated following comprehensive research

Three SCE researchers and senior lecturers, Dr. Lior Aronshtam and Dr. Tammar Shrot from the Software Engineering Department and Dr. Ronit Shmallo from the Industrial Engineering and Design Department, participated in the TEE 2023 (Transforming Engineering Education) Conference conducted in June at Harvard University and MIT in Boston, both world class higher education institutions.

Researchers from 26 countries participated in the conference that included three days of fascinating lectures on engineering education delivered by experts in the various engineering fields, as well as meetings with researchers and opportunities for future collaborations.

The SCE researchers, in collaboration with the student Ayelet Ratz who earned her Master's degree summa cum laude in the Software Engineering Department in the Research Track, conducted a comprehensive study on Teaching Design Patterns, a useful tool for programmers in solving coding and program design problems. The study reexamined the method of teaching the subject - since without extensive practical experience it is difficult to learn and use it correctly.

Students have difficulty identifying and comprehending certain patterns more than others, and some students tend to use specific patterns even if they are unsuitable for the context. This is important since incorrect use of patterns may impair the quality of the system. The researchers formulated a more specific approach to teaching design patterns, which they presented at the conference, in the aim of helping beginners overcome these difficulties.

# The Engineers Who will Make the World a Better Place - **Are Already Here**

SCE awarded diplomas to 915 graduating bachelor's and master's degree students • The graduating Electrical and Electronics Engineering student, Ms. Jembar Pentiye: "I would like to thank the SCE faculty for their personal attention and all-encompassing accompaniment. We will continue to strive high, and consider every obstacle to be another step on the way to the top"



Hundreds of graduating students gathered on the Be'er Sheva and Ashdod campuses for the degree award ceremonies (bachelor's and master's degrees). The SCE, which in this most recent cohort trained 915 engineers, trains about 15% of all the engineers in Israel each year. The growing number of graduates is a testament to the enormous development of the college in training the next generation of engineers.

The exciting evening began with a procession of the graduates wearing the traditional cap, gown and sash. Among the hundreds of families we met one special family, that of the new Mechanical Engineering graduate, Adi Korbashi (27). Adi came to the ceremony with her four siblings, all engineers and SCE graduates: Ovad (38) is an electrical engineer who graduated in 2013; Ran (36) a civil engineer who graduated in 2014; Einat (30) an industrial engineering and management engineer who graduated in 2017; and Hen (28) an industrial engineering and management engineer who graduated in 2019.

The excited Adi told us: "You could say that we are a pretty tight-knit family. We all live in moshav Patish, near Ofakim, and work in the south as engineers, in the fields we studied. For our parents this is a great achievement. They did not have the opportunity to acquire an academic education like the one the SCE gave use, and they aspired that we, the children, would secure our future. The path was not easy, but at its end I am filled with pride. The faculty were always there for us, made sure we succeeded in our studies, but didn't lower the bar. It already began in the academic preparatory program and continued throughout all our years of study".

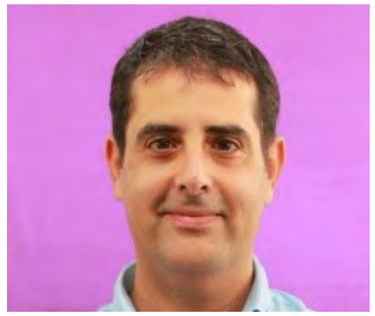
The ceremony began with the opening words of SCE Rector and founder, Prof. Jehuda Haddad, who said: "Dear graduates, our beloved country is often defined as the startup nation – a nation comprised of people who are at the forefront of innovation and technology; people who when they started out were as young as you were, and since then grew and developed. They are the source of groundbreaking ideas that will help in developing a healthy, strong, humane and more technological society.

"I am excited at the sight of the graduates, the kind we dreamt about 30 years ago when I had the honor of being a partner to the founding of Sami Shamoon College of Engineering. We strove to train young engineers who would be relevant for their time and would know how to connect the engineering and the social aspect. My excitement stems not only from the realization of the dream, but also because its realization created such a significant and rapid rate of growth. Today, SCE is the largest college in Israel in the engineering fields and its contribution to society and industry is known and recognized in the world. I am confident that you will continue what many good people like you began, and that you will show the world your abilities. Prosper and succeed!"

The Electrical and Electronics Engineering graduating student, Ms. Jembar Pentiye, spoke on behalf of the graduates: "It is a great honor to speak as a representative of the graduates. We waited for this moment, to gather here with great satisfaction and pride. We had four years of studies and experiences, we developed and grew, matured and forged friendships that helped us traverse the challenging period. The faculty were a 'mother' and 'father' for us, cared for us and provided the necessary framework for success. I would like to thank the faculty, on behalf of all the graduates, for their personal attention and all-encompassing accompaniment regarding any problem or difficulty. A thank you to our families and friends for their support throughout the journey. Wishing everyone success and robust healthy. We will continue to strive high, and consider every obstacle to be another step on the way to the top".

On the Be'er Sheva campus, Education Minister, Yoav Kisch, and Mayor Ruvik Danilovich also came to congratulate the new graduates. On the Ashdod campus the mayor of Ashdod, Dr. Yehiel Lasri, congratulated the graduates.

Academic Faculty



## Dr. Ziv Brand

Mechanical Engineering Department
Be'er Sheva campus
Academic faculty member

Dr. Ziv Brand, married and the father of three, lives in moshav Gilat. He earned his B.Sc. in Electrical and Electronics Engineering summa cum laude from SCE in 2003, as well as a certificate of excellence in his M.Sc. studies. His PhD dissertation dealt in optimization and control of rotating thin-walled cylinders.

Before coming to SCE, Dr. Brand worked at the Negev Nuclear Research Center as a researcher and developer in the control and dynamics field as well as in senior management positions. He received several best research awards and academic distinction awards.

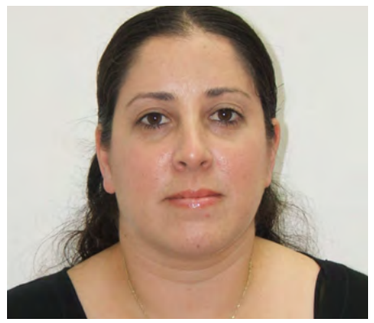
"Out of a passion for research, love of teaching, and an understanding of the need to provide good training and education to the future generation of engineers, two years ago I decided to join the SCE Mechanical Engineering Department on the Be'er Sheva campus as a faculty member and senior lecturer. I currently head the Control Research Center of Flexible Mechanical Systems which I founded, that has international collaborations, research fellows, research assistants and students. I developed and taught new courses and was a member of the committee that acted to receive Council for Higher Education approval for awarding a master's degree with a thesis in Mechanical Engineering."

"My research activity combines theoretical, computational and experimental work, as well as integration and adaptation of the research outputs to groundbreaking engineering applications. The findings of my work are published in the literature and at scientific conferences.

"My research collaborations include those with researchers from academia and industry in Israel and abroad, the most prominent of which are Chiang-Mai University in Thailand, the National University of Life and Environmental Sciences of Ukraine, Ben-Gurion University, the Negev Nuclear Research Center and the Soreq Nuclear Research Center. A research proposal I submitted to the Ministry of Innovation, Science and Technology was recently accepted, as part of Israel-Ukraine collaboration".

In preparing his lectures, Dr. Brand focuses on driving motivation and creating curiosity among his students. "I invest significant efforts connecting the engineering and academic tools they use to the engineer's everyday reality. My goal is to give them a practical and meaningful background that will help them successfully contend with professional challenges in the future".

Administrative Staff



## Hila Folkman

Purchasing Coordinator
Purchasing and Agreements Department

I took my first steps at SCE in 2003, in a data entry position in the Operations Division. Over time the position was updated to that of secretary. In 2010, following an organizational change, the Purchasing Unit was separated from the Operations Division and reorganized under the management of Gerard Amor within the Finance Division. My position was updated accordingly to Purchasing Coordinator.

This is an independent and challenging position with great responsibility. The feeling was that I had begun to engage in a new and different field that is very interesting and challenging – working with both SCE employees and external suppliers. I can say that my professional growth and development are closely intertwined with the growth and development of the Purchasing Unit.

In my free time I like to listen to music from all periods, to read books - mainly mysteries and romances, and to watch thrillers and comedy series. Every once in a while I write stories, for my own enjoyment, and when I want quality time with myself - I take long walks. It is an excellent time to organize your thoughts and conjure up plans.

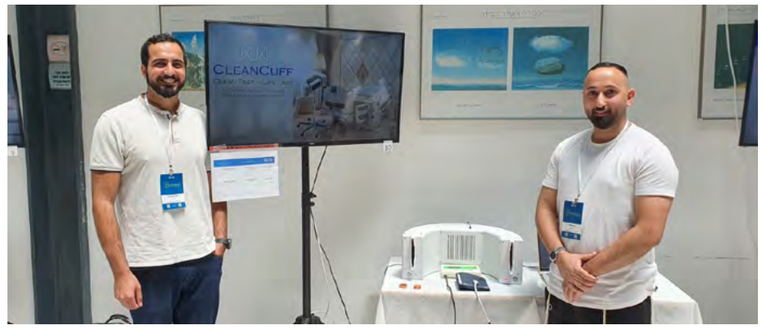
I completed my studies in 1999 at the Technological College in the Marketing track, with a diploma as an industrial engineering and management practical engineer. Going forward, while working at SCE, I also completed a B.A. in Management at the Open University.

SCE in general, and the Purchasing Unit in particular, are a second home for me. Relations with my colleagues and with SCE workers in general are close and productive, and over the years I got to know them and to connect with them. I especially enjoy the fact that I have someone to rely on at work - professionally and personally.



# Automatic Disinfection: The Development that will Save Lives

**Shoham Cohen and Tzachi Lavi, SCE graduates, developed a device for automatic disinfection of blood pressure cuffs in the aim of reducing nosocomial hospital-associated Infections and saving lives • There is also a personal story behind the development of the device**




CleanCuff - an automatic device for disinfecting blood pressure cuffs, that prevents infections and saves lives, is a groundbreaking development of Shoham Cohen and Yitzchak (Tzachi) Lavi, graduates of the Mechanical Engineering Department on the Be'er Sheva campus.

Nosocomial infections (hospital-associated infections) are common among hospitalized patients. Preventing them will reduce the load on the nursing staff, save hospitalization costs and reduce morbidity and mortality among patients with weakened immune systems.

Blood pressure cuffs that are not properly disinfected were identified as a source of spreading infections, and the device developed by Shoham and Tzachi, under the guidance of Naama Agassi, a faculty member in the Mechanical Engineering Department, aims to prevent these infections. This is an automatic, fast, efficient and user-friendly device. The disinfection method uses UVC (ultraviolet C) radiation - which is inexpensive, fast, chemical-free, and effective against a wide range of pathogens.

There is also a personal story behind the development of the device: up until recently Tzachi, a resident of Kiryat Gat, accompanied his mother who struggled with cancer and passed away several months ago. The time he spent accompanying her raised his awareness of the need to protect patients with weakened immune systems from external infections prevalent in healthcare institutions. Shoham, his partner to the project who lives in Otniel, is married to a pediatric intensive care nurse at the Soroka Medical Center.

Both Tzachi and Shoham understood and recognized the need to develop this life-saving device, which is currently one-of-a-kind.

The head of the Mechanical Engineering Department, Dr. Gedalya Mazor: "Graduates of the Mechanical Engineering Department have high-level knowledge and engineering abilities, but mainly creativity and out-of-the-box thinking. The Project Oriented learning method used at SCE, that combines theoretical studies with practical experience and actual tasks in the engineering field, imparts interdisciplinary knowledge and provides our students, among other things, with practical acquaintance of the medical world. The result is that our students think of developing quality and life-saving products and devices of great benefit to the public"

# **The Solution to the Attention Problem in the Education System** Begins with Sports Exercises

“The corona taught us that the education system must find and adopt new technological solutions as part of the study curriculum”, says Reut Azulay-Feldberg, principal of the Menachem Begin primary school in Dimona. Azulay-Feldberg is referring to her decision to approve a pilot in her school of a new system developed by SCE Software Engineering students.

The system was developed as a final project of the students Yinon Hadad and Shay Weizmann from the Be’er Sheva campus, under the guidance of Dr. Irina Rabaev. The two students developed a game application they called FITrivia, which they presented, among other places, at SCE Tech Fest 2023. The application includes a quiz, and asks the participant to answer the question displayed on the screen by performing a movement in front of the computer camera.

The students, accompanied by Dr. Rabaev, built a model that identifies the physical exercises, and which collected over 300 thousand pictures (about five hours of filming). The model analyzes the movements, builds a graph of the movements based on performance of the precise movement of the physical exercise and the performance frequency, but does not save the picture – to ensure participant privacy. The model identifies the exercise with over 80% precision and assigns a score to the participant. The score is not only based on the correct answer to the quiz, but also on performing the physical exercise precisely, as well as on the duration of the activity and the response time. An additional innovation in the application is a feature that alerts the user if they performed the physical exercise incorrectly, and enables them to open a video clip where they can receive instructions for correctly performing the exercise, and then can perform it again.

The two students already began to plan the idea for the project during the corona period. Yinon recounts: “My mother is a physical education (PE) teacher at a primary school. Like everyone else we were at home during the corona, and my mother tried to teach PE classes via Zoom. There wasn’t a good solution for conducting PE classes on Zoom. The pupils did not cooperate and I saw the difficulty of dealing with this situation without having suitable tools. That’s where I got the idea to create software that would combine a sports social game with learning, would add an element of competitiveness and create a drive to learn, and could be integrated into any class, not only physical education classes”. Shay added: “The advantage of the system is that while the game encourages physical activity, it is suitable not only for PE teachers. Teachers can build a questionnaire about the material studied in class, open trivia rooms and create interest in the study material”.

The two students conducted a pilot at a primary school in Dimona. The pupils were tested on the game and exhibited higher engagement, both in the physical fitness exercises and in the material about which they had to answer questions. Reut, the school principal, recounts her side of the intriguing project: “As a principal, I identify the children who lose interest in PE classes as they grow older. It is not easy to inculcate a healthy lifestyle in children. When I heard about the connection between trivia and physical activity, I really liked the idea. I know that competitiveness encourages participation in sports activity. As teachers we look for resources that will raise the children’s attention level, and therefore I was happy to help the students in this interesting project, in the hope that within a short period of time it will be introduced into schools throughout the country”.

The two students note that while the system was developed for schools, it has already attracted interest among additional entities, including special education classes and the ADI Negev-Nahalat Eran Rehabilitation Village. This is owing to the system’s ability to help individuals who must perform physiotherapy exercises, and this under the guise of competitive game-playing activity.

“We shared the basic idea among friends, and it reached Rachel Yahav, an occupational therapist who works at a physiotherapy clinic. She contacted us and said that physiotherapy clinics are in real need of tools that combine experiential activity with sport, particularly the kind of tools that the patients can also use at home. Rachel joined us as an academic advisor and actively participated in defining the requirements and the exercises, so that the application would be suitable for pupils as well as for persons undergoing physiotherapy. We are glad and hope to be able to soon meet these challenges”, summed up Yinon.

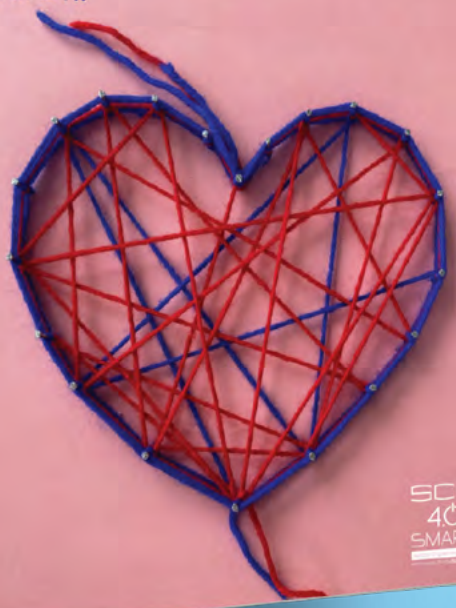
An intriguing final project presented at SCE Tech Fest 2023 offers a system that arouses interest in the material studied in class and encourages sports activity

Chemical Engineering

Auditorium 110 • 27.6 • 10:00

## Engineering Personalized Tissue Implants: From 3d Printing To Bionic Organs

by Tal Dvir



SCE 4.0 SMART

Electrical Engineering

Auditorium 110 • 26.6 • 17:00

## Innovations In Optical Communication Through The Atmosphere

by Dan Sadot

SCE 4.0 SMART