

ISBEP Challenges Semester 2023/2024

Portable responsive horticultural device

Challenge owner: TU Eindhoven/HAS Den Bosch

Summary: Our world has seen quite a few cases lately in which food became scarcely available to people in emergency areas. For those people, having a collapsible plant growth device that can be transported to them could be life-saving. Our challenge is to come up with a first idea and prototype of such a growth device for optimizing growth

For students from: AUBS, CE&C, CS&E, EE, IE & PT



Energy transition

Challenge owner: Neways

Summary: The demand and supply of electricity and heat do not match in time with overload in the network as a result while storage capacity is not used. This leads to consumers buying electricity when it is expensive and supplying it when no one needs it at low or maybe even negative prices. In this challenge, We will look into using green hydrogen

For students from: AUBS, AT, CE&C, DS, EE, ID, IE, PT, SI & ME

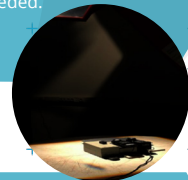


Advancing the sun simulator setup

Challenge owner: Eindhoven University of Technology in collaboration with the Intelligent Lighting Institute (ILI)

Summary: Light is a crucial element in the day lives of all people, whether it be for biological reasons, working conditions, safety, or aesthetic pleasure. However, we spend 90% of our time indoors. Therefore it is important to design indoor spaces that allow sunlight to enter. On the TU/e campus, a solar simulator setup is used for allowing people to experience visually and physically the presence of sunlight in indoor spaces. The simulator is however massively outdated, and new ways of demonstrating physically the presence of light in buildings is needed. The system can make use of both new and existing components.

For students from: AT, AUBS, DS, EE, ID, IE, AM & ME



Autonomous Information Network

Challenge owner: Sita Robotics XTMC

Summary: We are building robots that can explore dangerous environments before people have to enter. In the near future, this robot will have the need for more autonomous features, enabling the use of more robots simultaneously and therefore creating a higher efficiency. For this concept the controller needs to be redesigned and research needs to be done what is needed for edge-computing on the robots and which computing is needed for this idea. Besides a more high-level design is needed to see what capabilities we would like to give to the client and what we can do autonomously.

For students from: AT, AM, AUBS, CS&E, DS, EE, ID, PT & ME



Classification of robot pickable products in logistics

Challenge owner: Vanderlande Industries B.V.

Summary: Every day, Bol.com alone delivers more than one million packages to people in The Netherlands. These packages all need to be picked from warehouses. Vanderlande's Smart Item Robot can typically pick around 60-90% of all the different types of packages, and for the other items a human worker is informed at the moment this picking is impossible. In order to make this process more efficient, a classification of pickable items is needed. I

For students from: CS&E, DS, EE, ID, PT, IE & ME



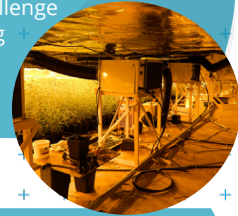
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The Undergrond Challenge

Challenge owner: Dutch police

Summary: Drug production in The Netherlands does not seem to be increasing, while we are encountering fewer production sites. This makes us believe that more and more drug production sites are moving to underground locations. Existing detection tools are no longer adequate. Our challenge is to develop a technical tool to detect underground drug production sites and catch the people involved.

For students from: BME, AUBS, EE & MST



Waste to Infrastructure & Other Applications

Challenge owner: Engineering Without Borders, Henny Romijn

Summary: The Waste to Infrastructure project is an Engineers Without Borders NL initiative to work with partners in West Africa to turn the huge plastic waste problem into an entrepreneurial opportunity. Together with local businesses in West Africa, EWB-NL is looking to build a consortium of stakeholders in plastic waste to share knowledge

For students from: AUBS, IE, ME & SI

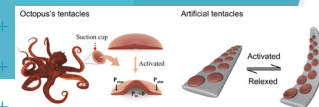


Adaptive soft robotics

Challenge owner: Human Interactive Materials

Summary: Soft robotics is a relatively new subfield of robotics, which can fill the gap in the adaptability of manipulators to the environment. Inspired by the octopus tentacles, we aim to develop artificial tentacles embedded in electric sensing and actuation functions by coupling the conductive materials and responsive materials.

For students from: AM, CE&C, EE, ID & ME



The Gate Venue 2030

Challenge owner: The Gate

Summary: The Gate is the TU/e venue for tech startups in the Brainport region. The building is old-fashioned and needs an overhaul to make it more sustainable and a showcase of the sustainable solutions that are already possible

For students from: AUBS, CS&E, DS, EE, ID & PT



From Photonics to Agriculture

Challenge owner: Photonic Integration research group, and Eindhoven Hendrik Casimir Institute (EHCI)

Summary: You can see in your daily life that we are not sustainable enough. However, you notice that each day we demand more and more from our world. What would you say if I stated that new technology exists to get things faster and greener at the same time? Photonic Integrated Circuits is a Technology that harnesses the power of light to create energy-efficient, faster, and more accurate microchips. It enables new functionalities to achieve a more sustainable world...

For students from: AP, AM, AT, EE & ME

