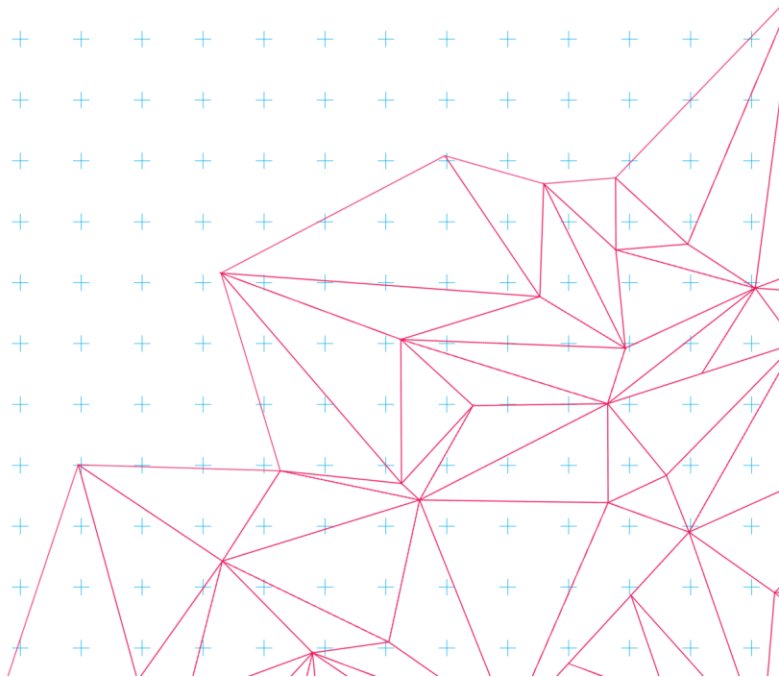
Challenge name	The underground challenge
Challenge owner	*Dutch police*
	Marcel Derks (first contact) Martijn Hekster Mies Haverkate
Brief summary	Drug production in The Netherlands does not seem to be increasing, while we are encountering fewer production sites. This makes us believe that more and more 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.

About the challenge owner

During our work we are frequently confronted with the consequences of drug production in the Netherlands. serious pollution of the environment, dangerous living situations for and danger to public health. Our mission is to prevent this situation by early discovering and dismantling production sites



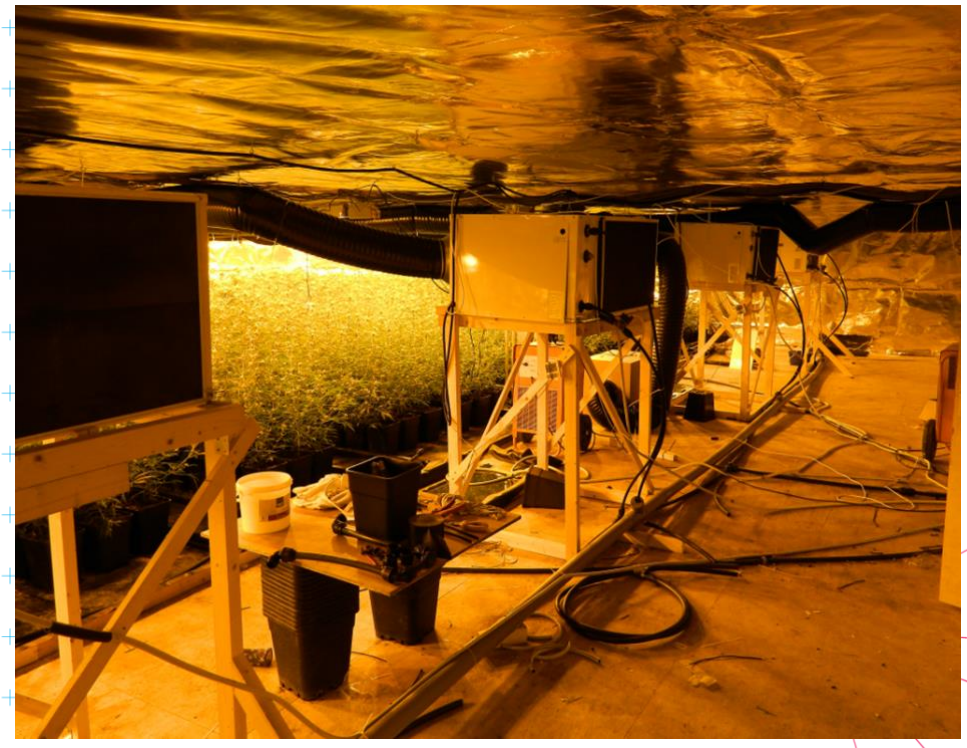
Challenge description

In the past, we tended to look for hemp growers by flying helicopters over densely populated areas on days when it had snowed. Rooftops that were free of snow were an indication that something criminal was done there. With the growing number of drug labs, we had to improve our identification techniques. This has helped us a lot, but now it seems that criminals are taking their production sites underground, where our current localization techniques are not sufficient.

We encountered underground labs before, and found an array of hardware that produces vibrations, specific sounds, or operates at certain wavelengths. We are currently unable to locate these labs from above the ground, and we are not allowed to simply enter any building without a permit. This is where we need you. We want you to come up with innovative ideas to detect underground drug labs from above. The public prosecutor is heavily interested in this process, and your contribution might be groundbreaking in our pursue to catch criminals.

The challenge contains elements of sensing and detection of various types of signals, whichever signals you deem relevant. We can provide you with a hardware package from an actual hemp farm to build a testing environment for the detection of these devices.

Challenge pictures and company logo



Input and involvement of challenge owner

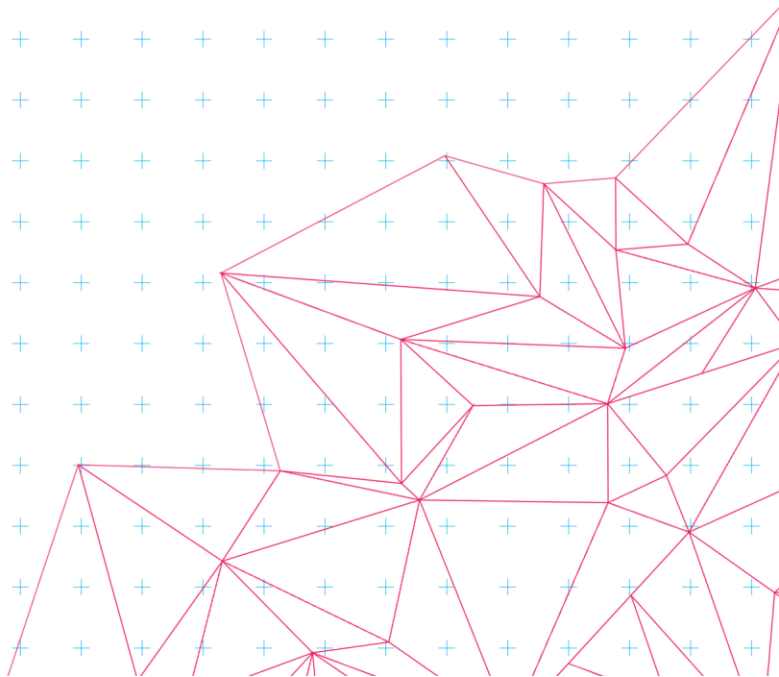
We can provide knowledge, expertise, and hardware of a production site for the benefit of the challenge.

The solution of this challenge helps our organization with the detection of production sites. It also would help society in general given the harmful effects as described earlier.

Resources

What resources are necessary for the students to work on the challenge?
Materials to recreate a production site and a huge dose of creativity.

What resources do you offer to students?
We can provide knowledge, expertise, and hardware of a production site for the benefit of the challenge.



Roles of different disciplines (only for ISBEP)

Architecture, Urbanism and Building Sciences	As we are potentially looking for signals that we need to be able to detect through layers of soil, concrete, wood, metal, or whatever creative ideas the criminals came up with, knowledge of how certain sounds or other types of waves move through these materials can help understand which detection tool to use.
Electrical Engineering	Understanding the power and heat flows through the hardware components (and their close environment) can inform us about which sensing methods to apply.
Biomedical Engineering	Knowledge in molecular biosensing might be valuable in this challenge. Furthermore, BME students could provide value due to their contributions in image acquisition and processing.