

Challenge name	Martial arts & Technology for mental wellbeing
Challenge owner	SensAi Technologies, CORE (support from EAISI)
	<input checked="" type="checkbox"/> Company <input type="checkbox"/> Research <input checked="" type="checkbox"/> Student team
	Yama Sardj, Dirk van Meer, Dominique Fürst
Brief summary	<p>In short We are on a mission to make martial arts safe, fun, engaging, and with its positive values help people develop themselves physically and mentally. To do this, we are developing a dedicated coaching app with a smart punching bag.</p> <p>Our Product We are developing a hardware sports tech IoT solution. Our product is a coaching app with a smart punching bag, which measures users' data such as punching power, speed and reaction time of the punches. These in turn can be used to give personalized coaching and create a gaming experience to help users reach their fitness and mental health goals.</p> <p>We see ourselves as a data driven coaching company, developing an ecosystem where we can deliver high quality content, create an engaging coaching experience, develop a community and brand.</p> <p>Working together with gyms and fitness chains and martial arts champions we want to become the "Peloton" of martial arts. We see application of our solution beyond sports also in the wellness and medical market.</p>

About the challenge owner

[SensAi Technologies](#) is a startup from Eindhoven, currently being incubated by Ecole Polytechnique' Innovation Lab in Paris, where the Olympic Games 2024 will be held.

We have an international team of Dutch, German, Spanish and French. We are on a mission to disrupt how people experience martial arts and with this make the link to mental wellness.

Founder Yama Saraj picked up boxing at Tu/e sport center, after becoming Dutch student boxing champion, he made a road trip from Eindhoven to Afghanistan to give kids boxing classes in his native country of origin. This inspired him to develop a connected punching bag with a coaching app. The project is also inspired by Japanese martial arts philosophy and Manga figure “Kakashi Sensei”. We want to bring the coach/or sensei experience to everybody.

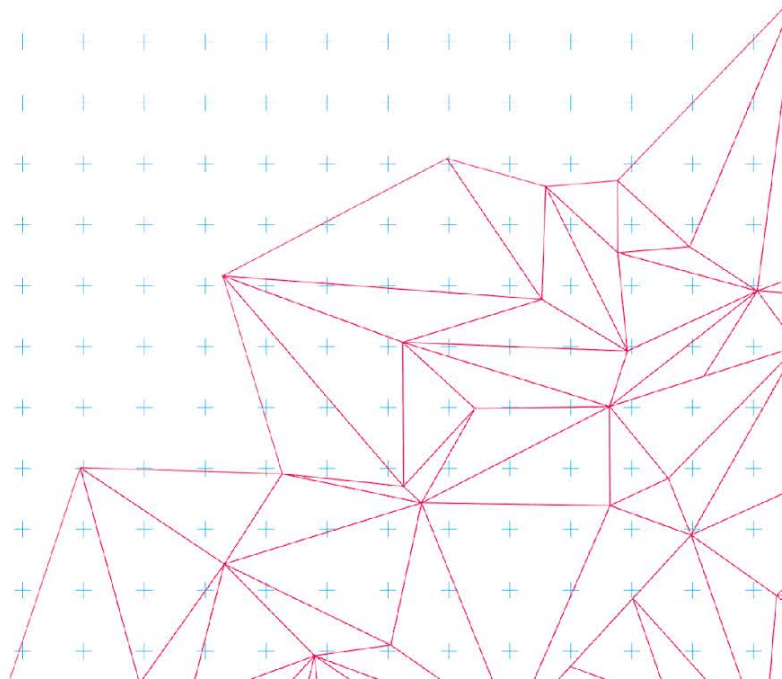
Teaser video about the story and concept
<https://vimeo.com/652662418/bbbd034faf>

A read about the project
<https://atelierneerlandais.com/spotlights-on-yama-seraj/>

Video about boxing as a therapy
https://youtu.be/gOdiJJ33_7s

CORE is a student team focused on sustainability, AI and personal development. Within this challenge these fields come together, a perfect representation of a CORE project.

www.core-chemistry.com



Challenge description

There has been substantial research about the positive mental health benefits of martial arts such as boxing. Specially in the aftermath of covid there has been a rise in mental health issue and health care organisations cannot handle the work load.

We aim to develop a connected punching bag that comes with a coaching app which in essence is complementing a sport coach or a therapist, not replacing them.

SensAi Technologies is developing camera and motion sensor systems to convert recycled car tires into smart punching bags. The tech is combined with digital training programs that are designed to improve physical and mental health for users. The idea has been to use recycled materials will make the martial arts-informed technology accessible to people in underprivileged communities.

Our aim is to design this device which could go in the field of domotics in the end, in a way that destigmatizes mental health issues interrelated to lack of physical movement, overweight. Above all we aim to build an ecosystem that brings different stakeholders around health and wellness to complements a coach and a therapist and with this act as a preventive measure that could reduce the cost of health care.

We build a previous proof of concept and the aim is to build forth upon this and help us industrialize this and find our "product-market fit "

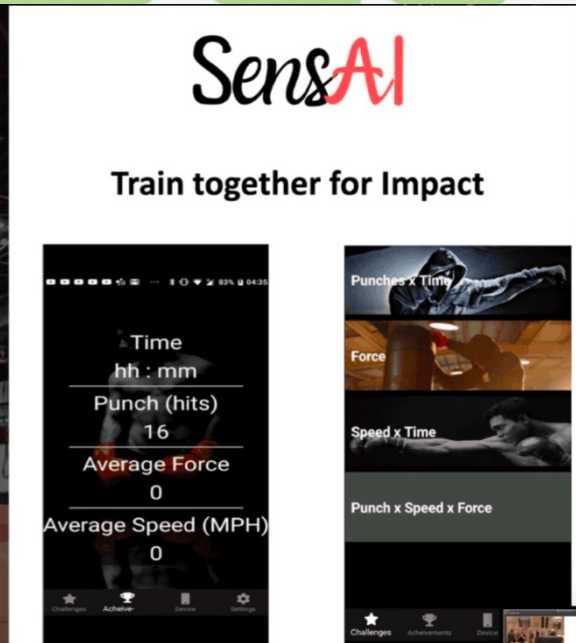
Currently we will start a pilot project at [Student Hotel Eindhoven](#) and a youth centre called [Stichting Baas](#) with youngsters. Relevant partners we are talking with are the Municipality of Eindhoven. Also, we aim to involve Design Academy and GGZE with this, as there is a project going on around mental wellness with them.

Bellow I summarize some technical aspects and areas where Tu/e students could help us with. Also there is some work to be done on the field of psychology and psychometric therapy/intervention.

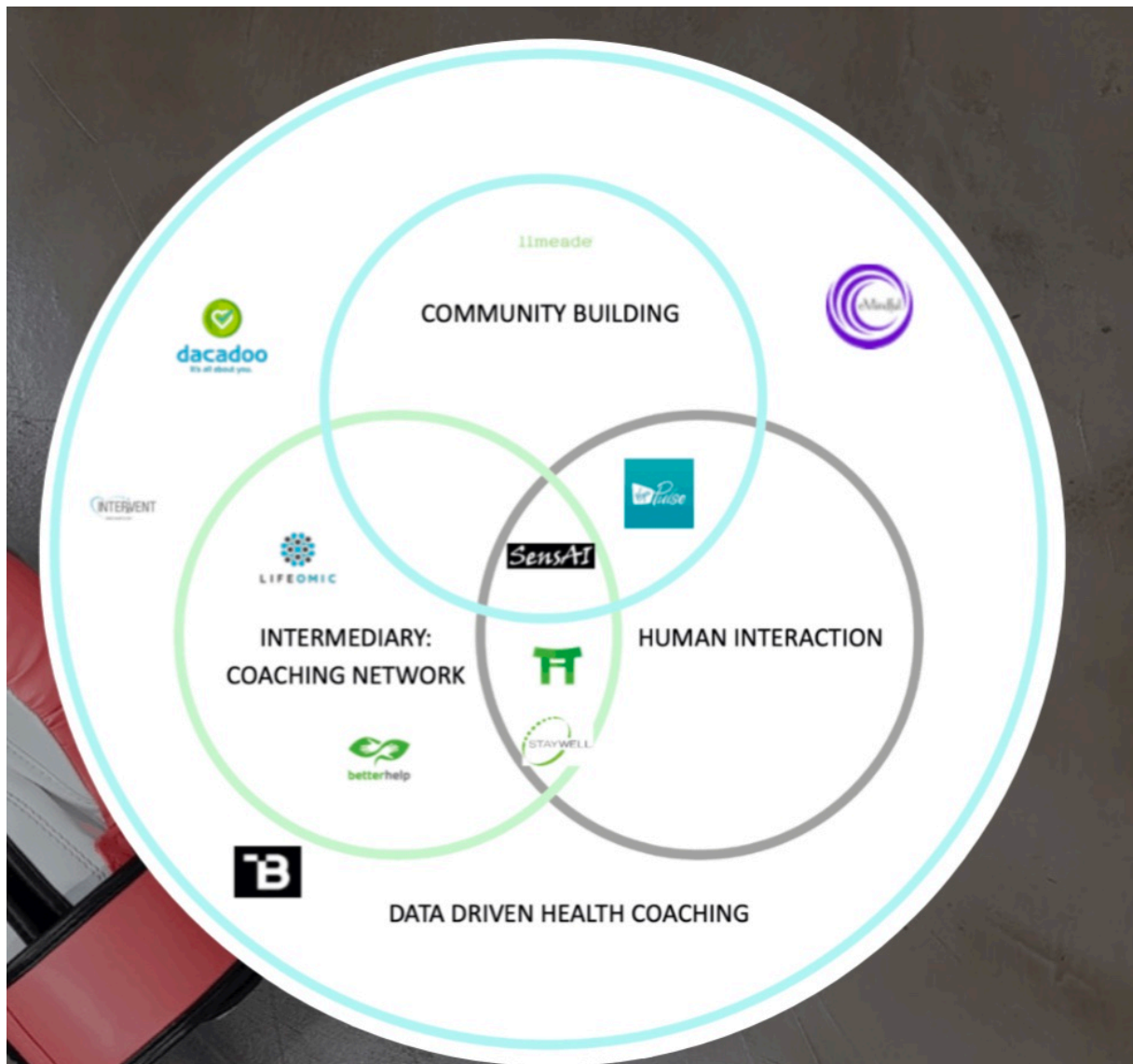
- *Industrial design: Help with User experience/ User interface research, and gamification.*
- *Computer science: App and software development*
- *Material research, which materials can we use for the design of the punching bag*
- *Mechanical aspect: We are still figuring out how to design the mechanical aspects in a way that is affordable, user friendly and involved usage of used materials.*
- *Electronics – which sensors to use and how to integrate these with the computer vision software.*

- *Ai-Computer vision “human pose estimation” we are working on this field and have our core competences in this. Our CTO is a data scientist and has been working for the French boxing federation as AI specialist. It would be great to involve Tu/e students with our research and dataprocessing*

Challenge Picture



Here is an early prototype  presented at data science week 's Hertogenbosch the Netherlands



Input and involvement of challenge owner

The team of SensAi Technologies is based in Eindhoven and Paris. We would be more than happy to be fully engaged with Tu/e. We would like to give regularly feedback

Resources

What resources are necessary for the students to work on the challenge?

What resources do you offer to students?

- Expertise; We have a multi-disciplinary team of industrial engineer, data scientist and a Phd in physics. Also, we have know-how about martial arts and to an extend mental wellness interventions.
- Materials; We have some working prototypes,

■ Workplace; In Eindhoven we have some locations where we are testing our solution. <https://youtu.be/WKD3Lc5xRk8> if students which they can come also to our lab in Paris.

□ Other, We would be more than happy to have an exchange with you students in Paris Ecole Polytechnique which is also a partner university of Tu/e with the EuroTech alliances. The Dutch Embassy in Paris would be more than happy to facilitate exchange.

