POWER UP
YOUR INNOVATION
IN ELECTRONICS

5E Contest Award Ceremony

Smart Systems Integration Conference 2021

27 April 2021, Virtual Event

Serena Zerbinati, MESAP
Fabrizio Fallarini, MESAP

The Coordination and Support Action 5E has received funding from the European Community's Programme Horizon 2020 under GA Number: 825113

5E Contest Objectives

POWER UP YOUR INNOVATION IN ELECTRONICS

Giving visibility to European Electronics Innovators
A spotlight on innovative electronics solutions

Recognizing the value of Electronics products at European level
NE, FOPE, ESS Electronics Areas

Shining a light on Electronics Areas convergence
Highlighting the Functional Electronics concept

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5E Contest Categories

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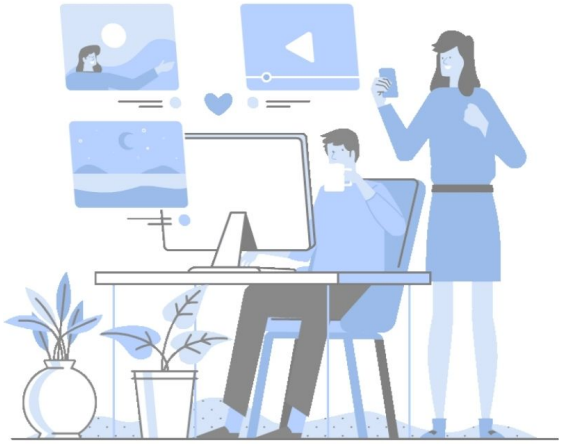

CATEGORY 1

Electronics products developed **in-house** by an interested party

CATEGORY 2

Electronics products developed in the context of a **funded project**

CATEGORY 3

Best product **convergence** among the Electronics Areas

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5E Contest Jury

Board of technical evaluators

Representing the European Electronics Industrial Associations

Evaluation criteria

1. The **innovativeness** of the solution
2. The **impact** of the solution
3. The **convergence** among the Electronics Areas of the project
   NE, FOPE, ESS
4. Obtaining **5E results & opportunities**
   Functional Electronics, Joint Vision, Vision Papers

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5E Contest Numbers

contest 2021 5e contest

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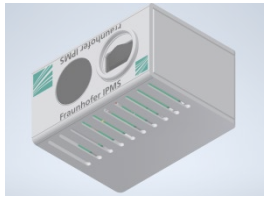
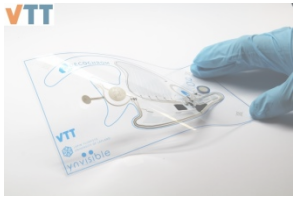
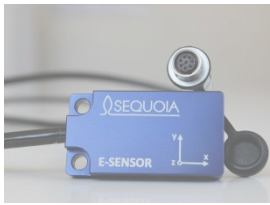
33
APPLICATIONS

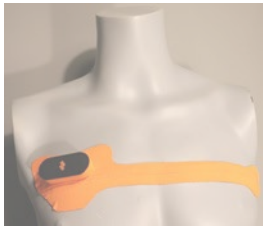
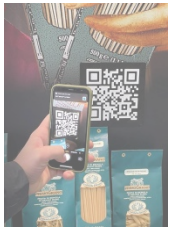
10
COUNTRIES

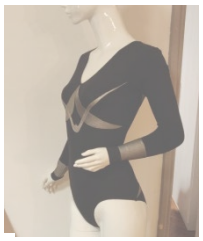






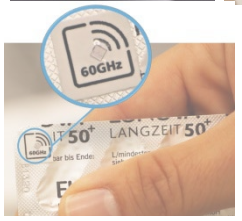




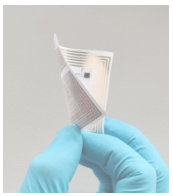









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5E Contest Winners

Public Announcement

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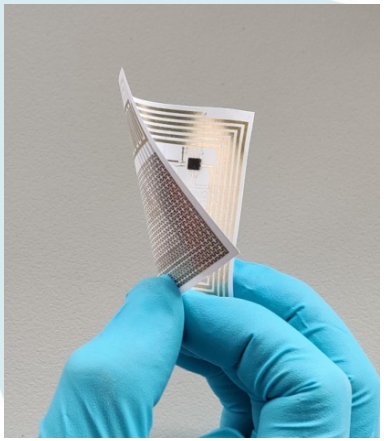
5E Contest Winners

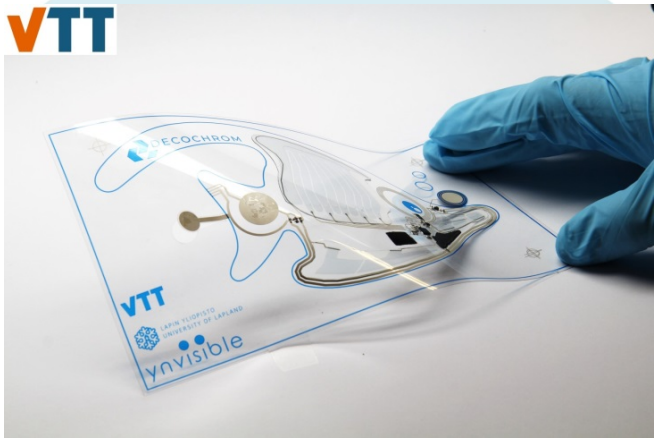
Congratulations!!



CATEGORY 1

Sustainable Multifunctional BiFace Sensor

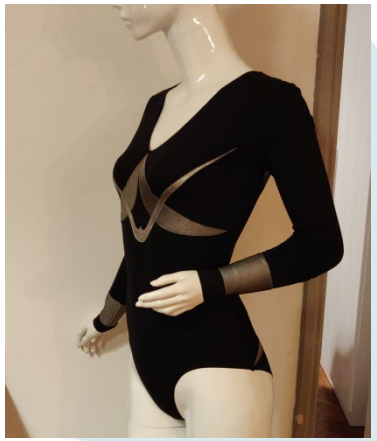
Silicon Austria Labs



CATEGORY 2

SENSYS:
The Electrochromic Fish

VTT Technical Research Centre



CATEGORY 3

Lilith

H.Y.P.E.

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5E Contest Winners

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CATEGORY 1

Best electronics product developed in-house by an interested party

Sustainable Multifunctional BiFace Sensor

Silicon Austria Labs

Austria

Johanna Zikulnig

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Sustainable Multifunctional BiFace Sensor

Johanna Zikulnig, Lukas Rauter, Thomas Moldaschl, Martin Lenzhofer, Sherjeel Khan, Lukas Neumaier, Sabine Lengger, and Jürgen Kosel

Research Unit Sensor Applications
Division of Sensor Systems
Silicon Austria Labs

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SAL SILICON AUSTRIA LABS

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Sustainable Multifunctional BiFace Sensor

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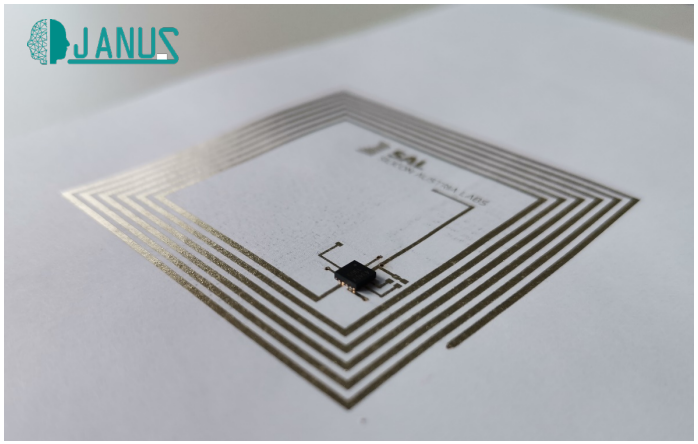
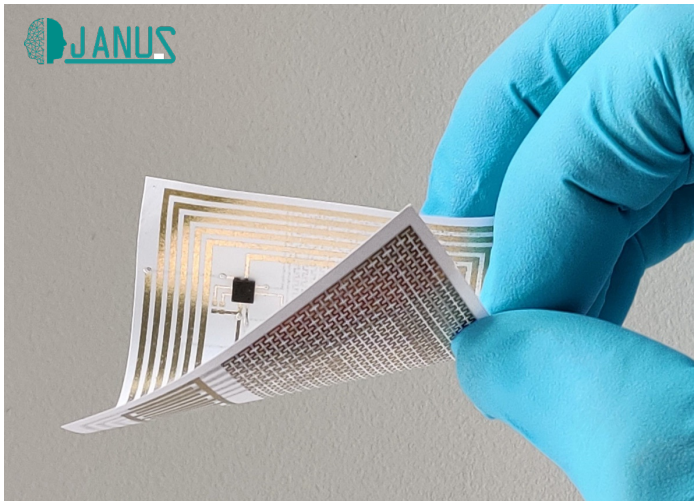
Silicon Austria Labs (SAL) presents:

A sustainable, multifunctional, flexible biface sensor on uncoated paper substrate that optimizes performance and minimizes material consumption by double-side printing (SAL Janus Technology(.

The tag includes a printed antenna, passive NFC chip and printed environmental sensors for humidity, temperature and strain.





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Sustainable Multifunctional BiFace Sensor

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Motivation

The fastest growing waste stream in the EU is electronic waste.
At the same time the number of sensors deployed increases at a high pace.
→ Urgent need for sustainable **“green”** sensor solutions!

SAL addresses these challenges with the development of a **multifunctional sensor** taking into account the **sustainability** of the fabrication process and device itself, while providing a solution for democratizing smart things.

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Sustainable Multifunctional BiFace Sensor

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Benefits

Efficient use of Resources:

- Renewable raw material → uncoated paper substrate
- Minimal resource consumption due to double-sided design
- Low environmental impact due to additive manufacturing (inkjet printing)
- Passive NFC chip → wireless, no battery required

Versatility:

- Adaptable platform, e.g. temperature, humidity, strain sensors...
- Freedom of design due to digital manufacturing technology (inkjet) for specialized sensing requirements.

Low-Cost:

- Renewable raw materials and efficient use of resources
- Additive manufacturing technology – low cost even at small batch sizes

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Sustainable Multifunctional BiFace Sensor

Manufacturing

Inkjet Printing and Curing:

- PixDro LP50 platform with Spectra S-Class printhead assembly (Fig. 1)
- Silver Nanoparticle ink
- Photonic curing (PulseForge 1200)

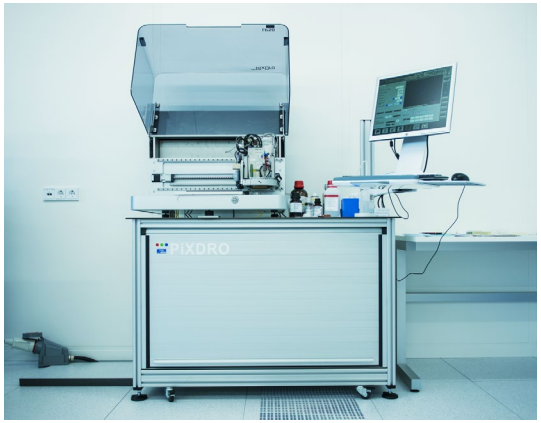

Fig. 1: PixDro LP50 Inkjet printer

Through Connection (Fig. 2):

- Formation of defined holes in substrate using Laser
- Vias filled with silver screen-printing ink

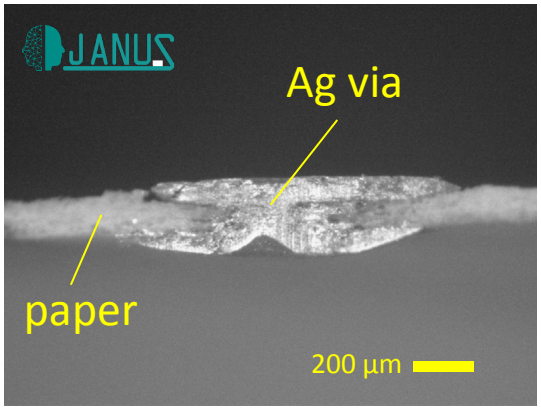

Fig. 2: Cross-section image of via through paper filled with silver ink

Hybrid Integration:

- Passive NFC chip adhesively bonded to printed circuit

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Sustainable Multifunctional BiFace Sensor

Demo

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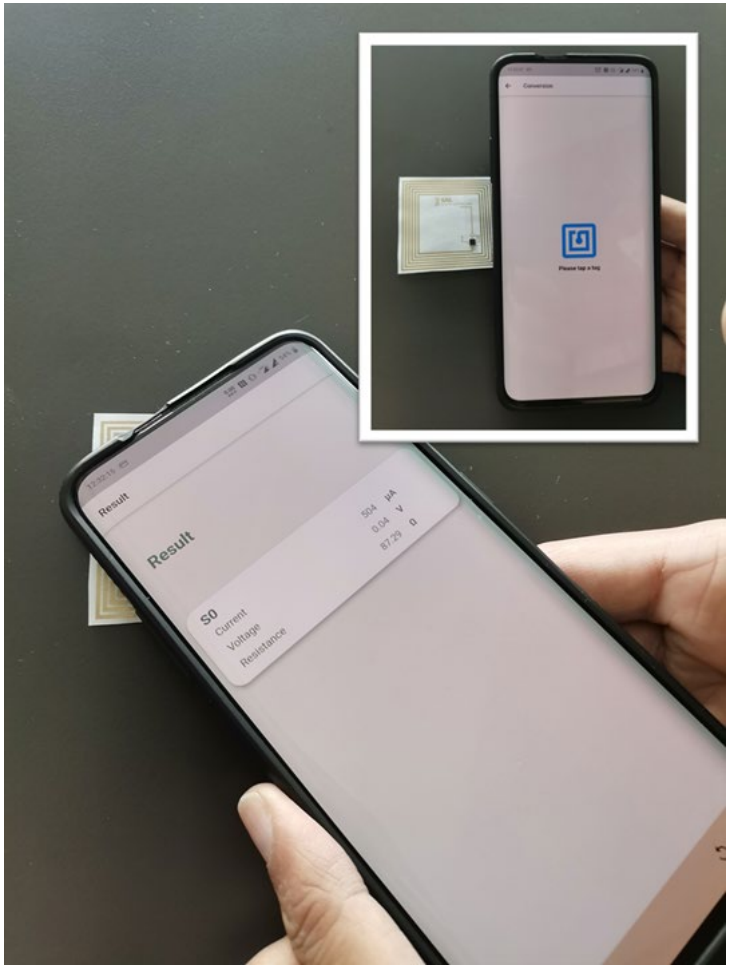
Sustainable Multifunctional BiFace Sensor

Vision

The Multifunctional BiFace Sensor is a game-changer in the fields of wireless, passive, low-cost, flexible and sustainable electronics for ubiquitous sensing applications

Evolution to a versatile and low-cost sensing platform for harsh environments and condition monitoring in the food industry by embedding the sensor platform into EVA foil



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Thank You!

Johanna Zikulnig
Johanna.Zikulnig@silicon-austria.com

Silicon Austria Labs
www.silicon-austria-labs.com

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SILICON AUSTRIA LABS

5E Contest Winners

Congratulations!!

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CATEGORY 2

Best electronics product developed in the context of a funded project

SENSYS: The Electrochromic Fish

VTT Technical Research Centre

Finland

Thomas Kraft

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DECOCHROM

H2020 EU project: decochrom.com

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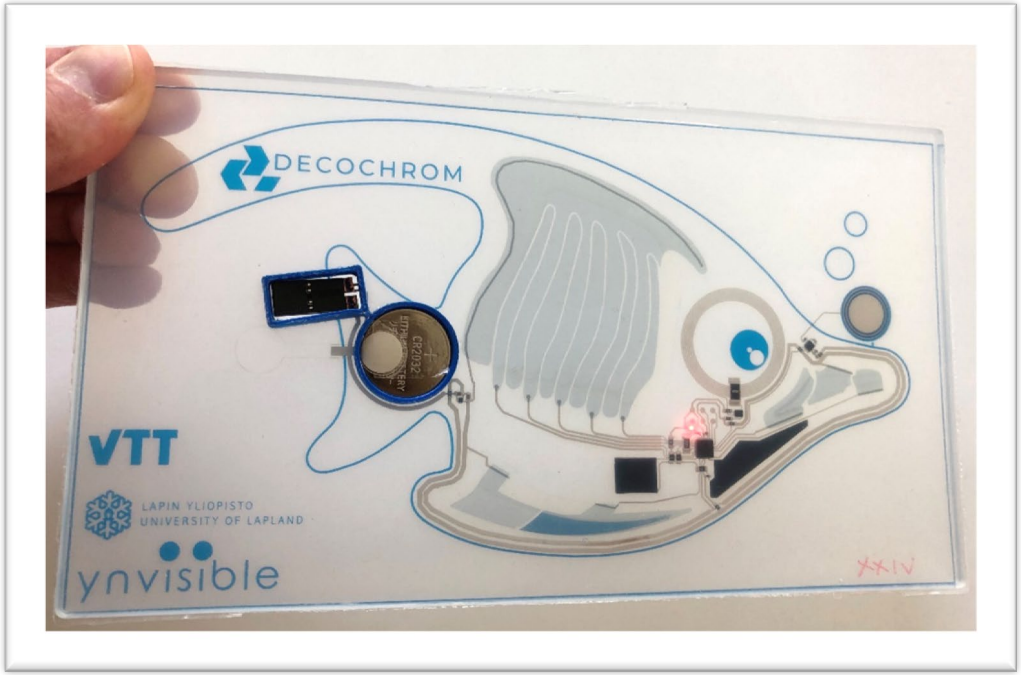
SENSYS: The Electrochromic Fish

Thomas Kraft
Senior Scientist, Ph.D.
Printed Materials Systems

VTT Technical Research Centre of Finland Ltd.

thomas.kraft@vtt.fi



VTT

ynvisible

LAPIN YLIOPISTO
UNIVERSITY OF LAPLAND

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DECOCHROM

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Decorative Applications for Self-Organized Molecular Electrochromic Systems

4.5 year project (January 2018 – June 2022)
Coordinator: University of Lapland

Electrochromic materials and systems as a source of creativity and market growth in design and **manufacture of consumer products**.

To technologically elevate printed graphics products to the age of interactivity, and **empower the creative industries with the tools** and material sets to design and build aesthetically pleasing practical **human interfaces to smart consumer goods and environments**.

https://www.youtube.com/watch?v=GfH4Hfn306s

Website: decochrom.com

Facebook:
https://www.facebook.com/decochrom/

Instagram: @decochrom

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DECOCHROM eeeee

R2R manufacturing for Printed Intelligence

VTT

2021 contest 5e contest 2021

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VTT Technical Research Centre of Finland Ltd. vttresearch.com

Printed components

- Circuits, printed solar cells, OLEDs, EC display
- Microfluidics, sensors
- Biobatteries

Flexible hybrid electronics

- Chip-on-foil, components on foil
- Integrating: Batteries, displays, E harvesting, connectivity etc.

Post processing to integrated systems

- In-mold labeling of functional foils
- Lamination, laser-cutting, biodispensing
- Functional testing

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DECOCHROM

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SENSYS Fish
Smart System Integration

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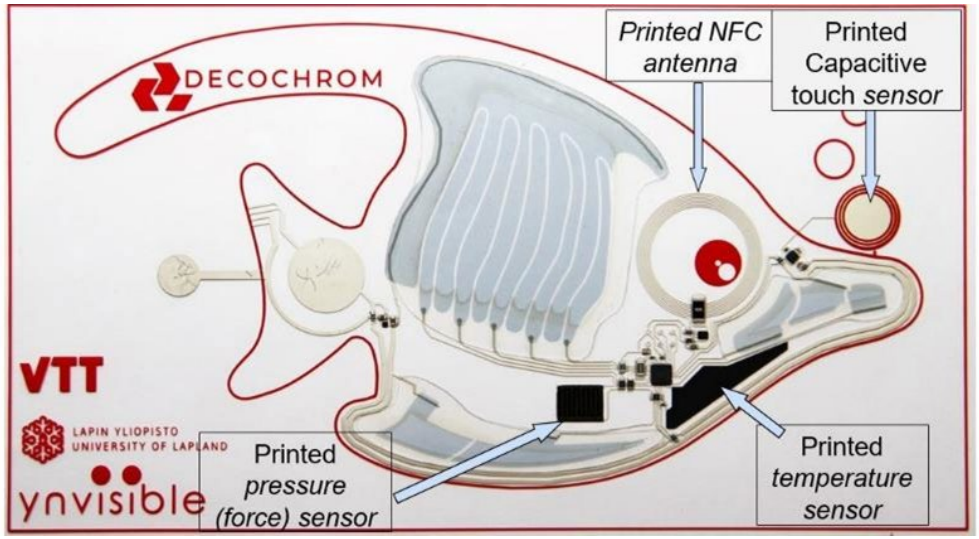
The multi-sensor hybrid system with electrochromic indicators:

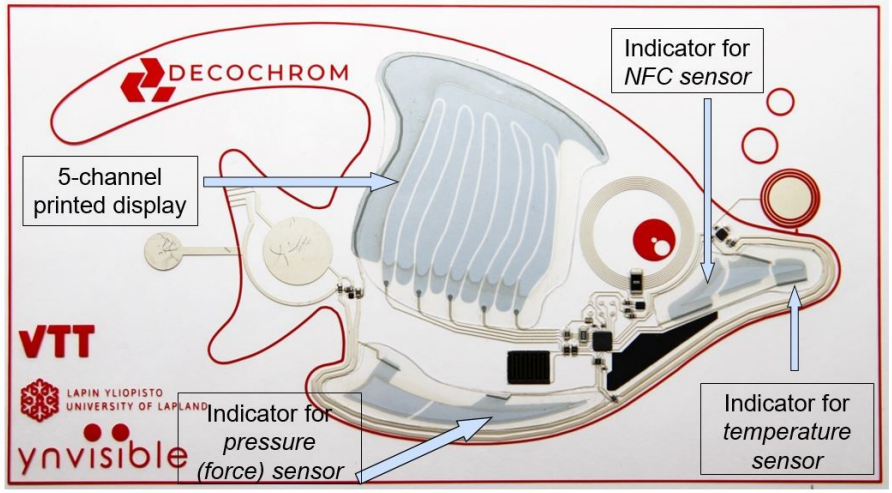
- Capacitive touch to toggle inputs
- Inputs: NFC antenna, Temperature and Force sensor
- Battery and plug-in power source options



Sensors

Displays

- **sensor indicator (1 channel)**
- **sensor intensity (5 channel)**



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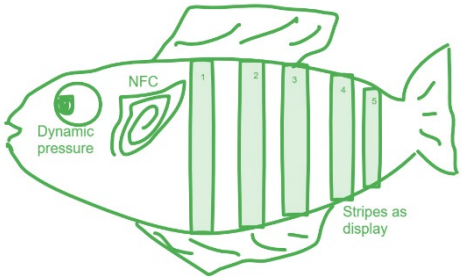
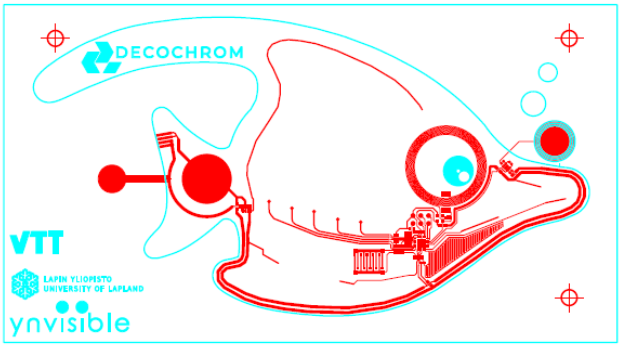
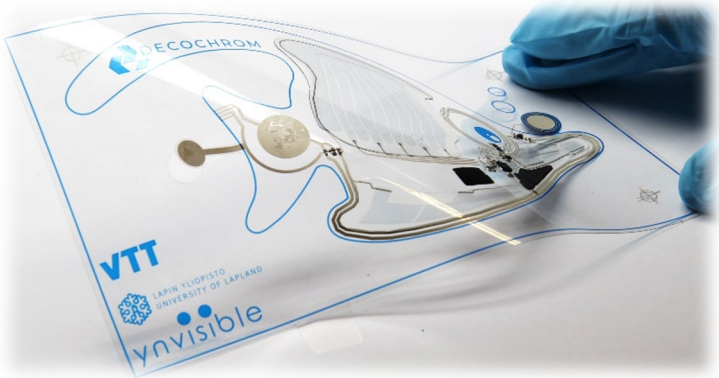
SENSYS Fish
The Design Pull



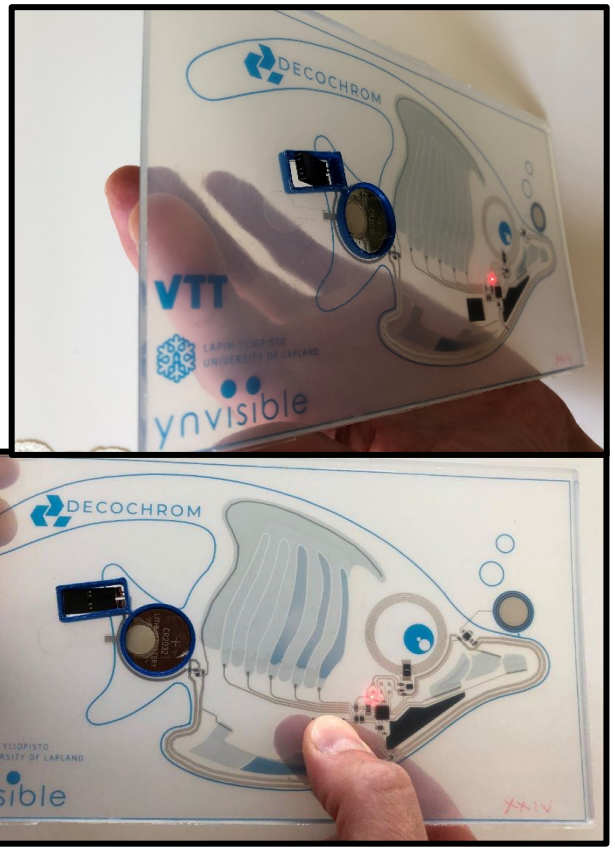
1. Designs

2. Electronics





3. Over-molded product



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SENSYS Fish
Structural Electronics

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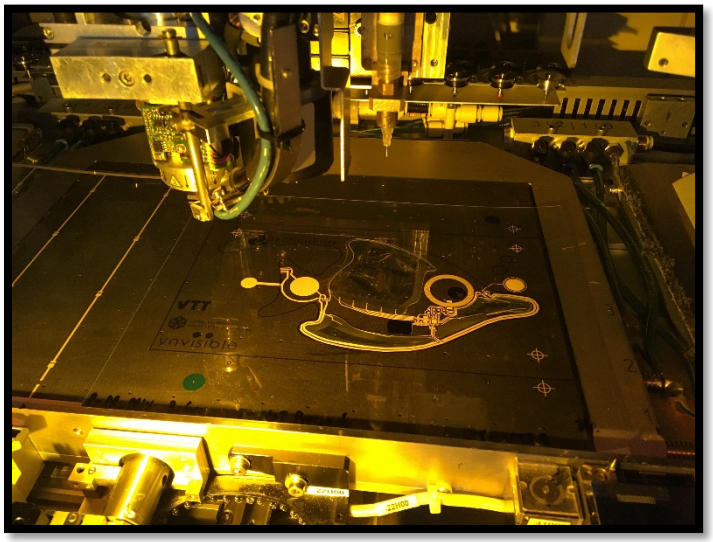
Structural electronics of a hybrid integrated sensor system:

- Combination of printed electronic elements and traditional surface mounted components
- Hybrid electronics backplane over molded with TPU for structure



R2R assembly and bonding line

Structural electronics product by injection over-molding

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DECOCHROM

decochrom.com

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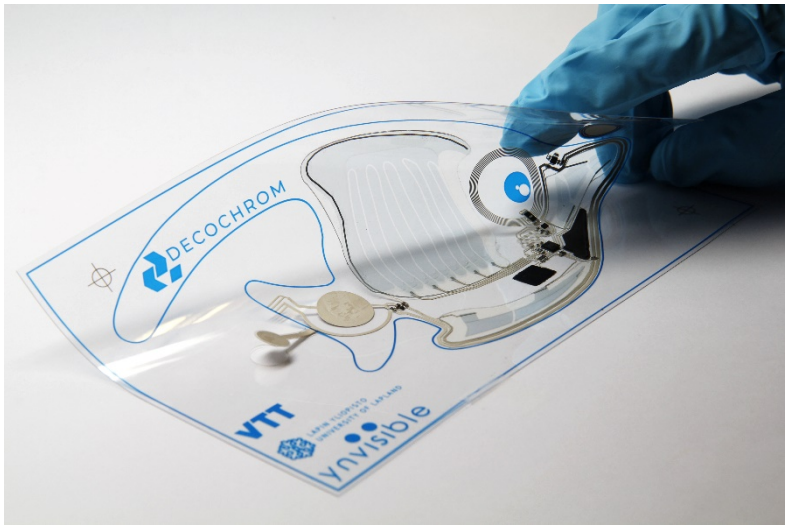
SENSYS: The Electrochromic Fish



*How will you **design** the **next** integrated smart **system**?*

VTT

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UNIVERSITY OF LAPLAND

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thomas.kraft@vtt.fi

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5E Contest Winners

Congratulations!!

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CATEGORY 3

Best electronics product convergence among the Electronics Areas

Lilith

H.Y.P.E. Srl

Italy

Zaccaria Cogo

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LILITH

HYPE

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LILITH

Your personal shield to combat violence against women

Background and history

Vision - **Technology** at the service of **users' needs**

2018 – the idea of making our contribution in the **fight** against **violence** against **women**

2018/19 - **development** of the idea and first implementation **solutions**

2020 – **Lilith** was born

What if...

LILITH by HYPE

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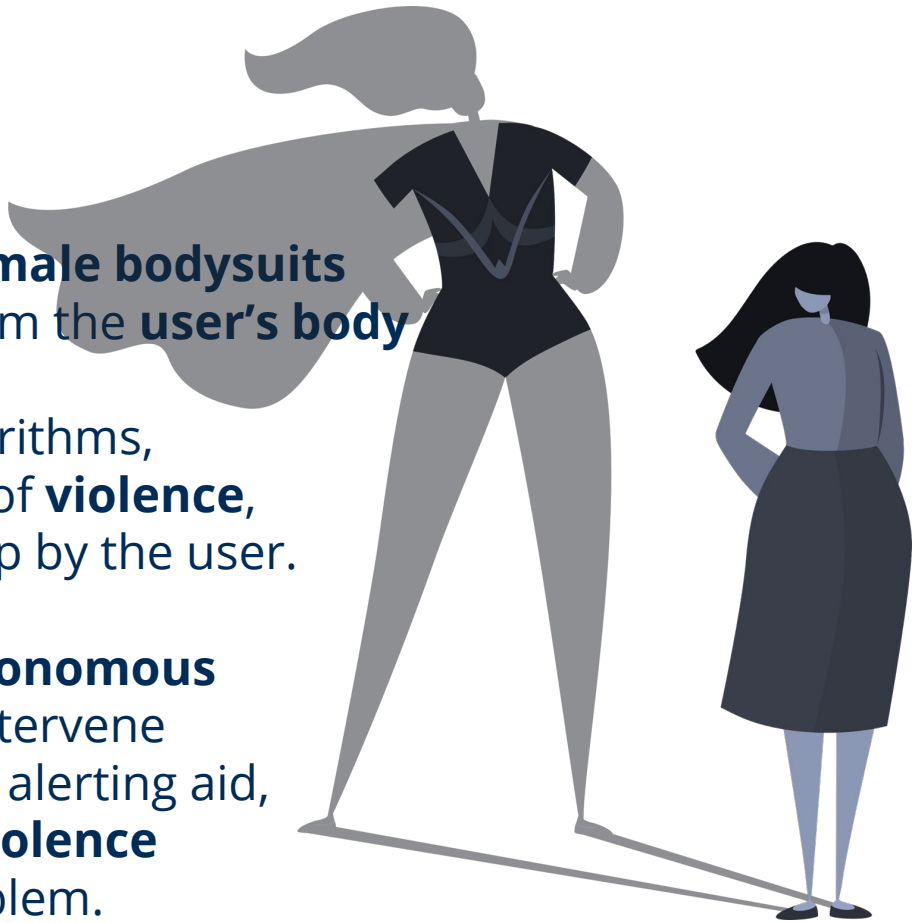
LILITH

Your personal shield to combat violence against women

Description

Lilith is a system made up of smart **female bodysuits** capable of **collecting data** directly from the **user's body** and sending them to a **mobile App**.
The App, thanks to **integrated AI** algorithms, can **recognize** and analyze situations of **violence**, forwarding an **alarm** to contacts set up by the user.

Lilith is a **comfortable**, **invisible**, **autonomous** and **automatic** system that aims to intervene suddenly in events of violence, quickly alerting aid, and **gives a voice to the victims of violence** to considerably reduce this social problem.



LILITH by HYPE

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LILITH

Your personal shield to combat violence against women

Value Proposition

01

Smart Fabric
Textile flexible sensors

TOTAL CONCEALMENT
DIRECT ACQUISITION OF SIGNALS
MAX GRIP & WEARABILITY

02

Proprietary AI
ML models

AUTONOMOUS & AUTOMATIC
IMMEDIATE ANALYSIS
SPEED OF INTERVENTION

03

Scalability
Adaptable to any outfit

HIGH DIFFUSION
EASY TO USE
FLEXIBILITY

04

Mesh Network
BT communication

FORWARDING ROBUSTNESS
FORWARDING SECURITY
FACTIVITY

LILITH by HYPE

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LILITH

Your personal shield to combat violence against women

Used technology

Conductive fabrics - made with the integration of **metal oxides** capable of acquiring different information: position, accelerations, pressures, capacity and resistance and biometric data. **Sensitive areas** are placed on:

- **Breast**;
- **Shoulders**;
- **Forearms** (sleeved version);
- **Glutes**;
- **Belly/groin**.

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LILITH

Your personal shield to combat violence against women

Used technology

ML models – Stocastic motion recognition our proprietary AI model, based on FNNs (**Feedforward Neural Netrworks**) calibrates itself, at each use, directly on the user and analyzes the kinetic and biometric data, verifying the consistency with beatings, falls and violence in general.

LILITH by HYPE

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LILITH

Your personal shield to combat violence against women

Thanks for your attention

LILITH

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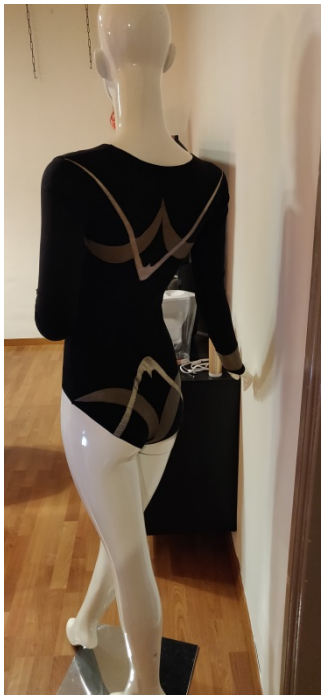
gm@hype-design.it



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THANK YOU

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DISCOVER +
5E website
www.5e-project.eu

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