PROJECT PISA

Platform Applying Intelligent Signal Analysis to gain insights into Plant Electrophysiology

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
Agroscope

VIVENT

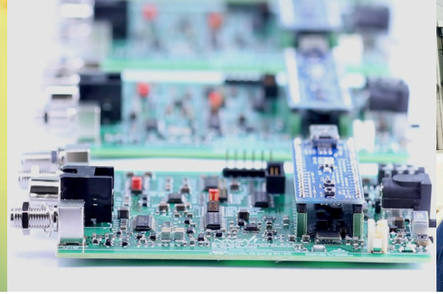
heig-vd
HAUTE ÉCOLE D'INGÉNIERIE ET DE GESTION DU CANTON DE VAUD
www.heig-vd.ch

HEIA-FR
HTA-FR

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Innosuisse - Swiss Innovation Agency



Plants emit small electrical signals called bio-signals.

They are emitted when plants change physiological states or respond to environmental influences such as light quality or quantity, moisture in the soil or air, nutrient levels, exposure to chemical, heat or cold, insect attacks or diseases.

Vivent, a Swiss-based bio-signal pioneer has invented an innovative range of devices- Phytl Signs, for exploring & monitoring electrical signals in a much easier, convenient, lower cost way than was possible before, and in all conditions.

By facilitating and accelerating this important work Phytl Signs hopes to contribute to increasing global food production and safety, in an environmentally sustainable manner.

Innosuisse is supporting *Vivent* and its partners in *Project PISA*, to further the development of this electrophysiology bio-sensor.

Advanced signal processing techniques will be used to analyse plant 'transients' collected by the Phytl Signs Researcher device. Research will be conducted in Agroscope's facilities.

Vivent SARL is working in conjunction with *Agroscope*, the Swiss center of excellence for agriculture research and the two universities of applied sciences *HEIG-VD* and *HEIA-FR* focused on applied research in engineering, management and architecture.

A Swiss collaboration of experts in key fields of agronomy, electrical engineering, intelligent data analysis and entrepreneurship, furthering the development of this bio-sensor.

HEIG-VD

- Data pre-processing and segmentation
- Features characterization and extraction
- Features selection for classification
- Intelligent data analysis
- Developing models to predict classes for unlabeled datasets
- Validating findings in conjunction with Agroscope and Vivent

HEIA-FR

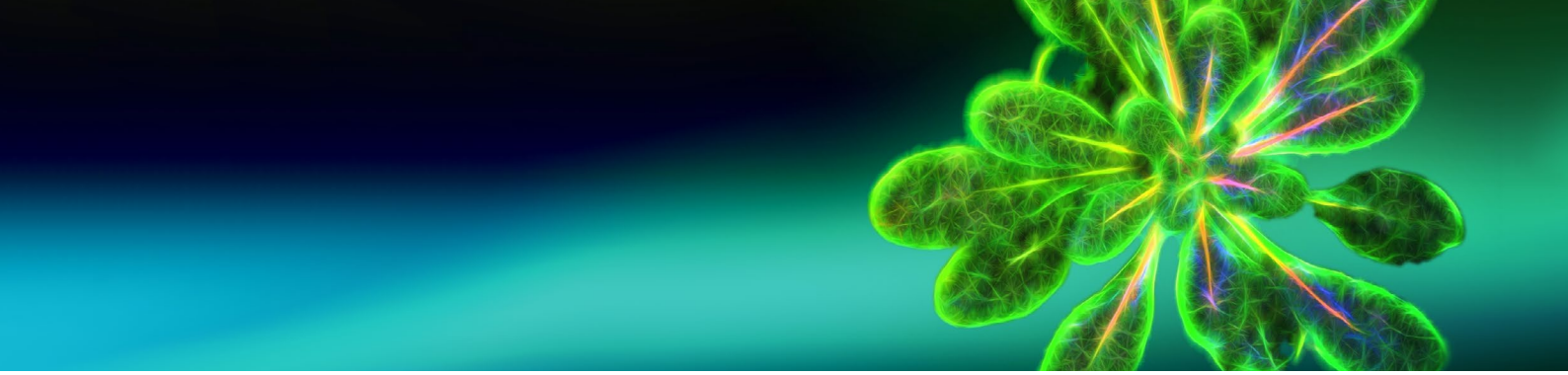
- Investigate alternative designs for recording system (hardware & firmware)
- Investigate device energy consumption
- In conjunction with Vivent define signal acquisition specification and optimal solutions for final demonstrator
- Reporting of hardware performance tests

Agroscope

- Implementation of multi-variable greenhouse-based plant electrophysiology experiments studying tomato plants through 3 growing phases and under various stressors: water, salt, insect, environmental
- Data provision for HEIG-VD data processing and modelling
- Input on device and software design
- Reporting of results for major scientific platforms and recommendations for growers

Vivent

Project management, leaf signal acquisition interface, casing and user interface design and implementation, results validation



PhytlSigns, innovative bio-sensors, harnessing electrical signals from plants

For Plant Researchers, **PhytlSigns RESEARCHER**

- Explore & monitor electrical signals over long or short time periods, more conveniently and at lower cost than before, in real growing conditions

  helping to understand plant electrophysiology,
  and plant reactions & adaption to environmental stresses

For Commercial Growers & their suppliers, **PhytlSigns PROFESSIONAL**

- Faster detection of problem insects, diseases and other plant stresses
- Helps minimize the need for costly treatments
- Shorter development cycles for assessing new growing solutions

  reducing crop loss, costs and boosting yield
  aiding the growing of crops in a more sustainable way

Learn more about PhytlSigns by following us on social media (Twitter and Facebook) or visit our website

www.phytlsigns.com

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PhytlSigns is designed & manufactured by Vivent SARL, the Swiss-based bio-signal pioneer.

Email us for information on

info@vivent.ch