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Interactive exhibit

OiO-Tech Project: Developing new phenotyping tools adapted for plant research

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The OiO project comes from the observation that agronomics research lack of tools to precisely characterise plant morphology and development, in contrast with the increasing possibilities offered by the rapid development of new technologies (smaller sensors and controllers, wireless acquisition systems, more powerful processors for analysis ...). Moreover, while automatons are getting more and more complex, researchers are given less freedom to adapt data acquisition to their specific needs. For that purpose, OiO-Tech projects aims at developing new phenotyping systems to measure variables for both plant environment, and its morphological and physiological characteristics, while leaving intact the ability of researchers to transform and adapt both hardware and software depending on their requirements. For development, OiO-Tech is working in collaboration with the LEPSE (INRA-MONTPELLIER) to develop, test and adapt new prototypes, benefitting from the expertise and structures of a renowned research unit.

Our first product has been developed in an effort to precisely measure grain abortion linked to water stress on maize plants. After harvest, maize ears are placed into our "MaGeek Box" where the automaton automatically takes photos of the ear and analyses them to determine the number of grain and the characteristics of those grains (surface, volume, type : aborted or not). Simultaneously, OiO-Tech is developing a planimeter for destructive leaf area measurements. This prototype is designed to be highly adaptable to a big diversity of plants and includes software to treat the data and precisely calculate green leaf area. While prototyping, OiO-Tech makes it an important issue to develop both hardware and software based on open-source systems such as Linux or Raspberry Pi so that users still have the possibility to change and adapt codes and data analysis to their needs.

Keywords: OiO-Tech, automatons, phenotyping, grain abortion, leaf area