THE ACRE COMPETITION

... and the Challenge ROSE experience

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ACRE Competition (Agrifood)

Agri-Food Competition for Robot Evaluation focuses on **autonomous weeding robots** as an **alternative to the use of chemical products**

- Politecnico di Milano
- Institut national de recherche pour l'agriculture, l'alimentation et l'environnement
- Universita' degli Studi di Milano
- Laboratoire national de métrologie et d'essais

CHALLENGE ROSE EXPERIENCE

BIPBIP team
« Bloc-outil et Imagerie de Précision pour le Binage Intra-rang Précoce »

PEAD team
«Perception Et binage Autonome des cultures en agriculture Durable»

ROSEAU team
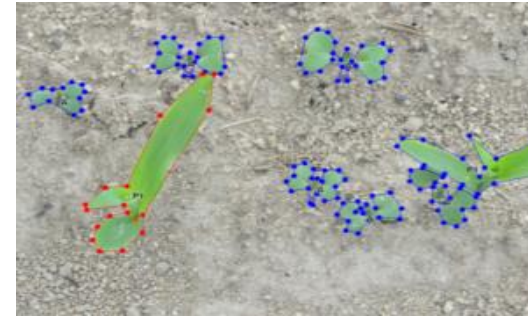« RObotics SEnsorimotor loops to weed Autonomously »

WeedElec team
«High voltage electric weeding by robot localized»

THE ACRE CHALLENGES (FBM & TBM)

- Robot **perception**
  - Plant / weed discrimination (FBM)
  - Leaf area / biomass estimation (FBM)
  - ...

- Robot **navigation**
  - Field Navigation (FBM)
  - Crop Mapping (TBM)
  - ...

- Robot **actuation**
  - Weed destruction (FBM)
  - Autonomous Weeding (TBM)
  - ...

Manual annotation

Hypothesis : Mask return

Crops & weeds markers

THE ACRE COMPETITIONS

ACRE organizes 1 dry-run campaign, 2 field campaigns, and 3 cascade campaigns (based on the field campaign data)

- **Field campaigns** are performed physically, open to public, and will involve robots
- **Cascade campaigns** are data-based AI/Robotics competitions happening online

1ST ACRE FIELD CAMPAIGN (& DRY RUN)

June 2021 @ **Montoldre** (France)

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June 2021 @ **Montoldre** (France)

Field
ROSE Challenge
Area : 4 ha

Montoldre INRAE site

Green bean

Maize

Two main crops (bean and maize)

Ray-grass

Mustard

Chenopodium

Matricaria

Six main weeds plants

2ND ACRE FIELD CAMPAIGN

May 2022 @ **Cornaredo** (Italy)

2ND ACRE FIELD CAMPAIGN

May 2022 @ **Cornaredo** (Italy)

New main crops (bean, maize, and ...)

New main weeds plants

ACRE Cascade Campaigns

Online Competitions based on **Dataset** from the field campaigns

- Targeted to Robotics and AI communities
- Based on field benchmarks and datasts
  - Plant discrimination (1st Cascade Campaign)
  - Leaf area estimation (To be confirmed)
  - Biomass estimation (To be confirmed)
  - Crop mapping (To be confirmed)
  - ...
- First Cascade Campaign launched today and based on the Rose Challenge dataset

BE PART OF IT!

- As **Competing Team** you could:
  - Help us in shaping the competition …
  - Participate with a Robot to field benchmarks
  - Participate online to Cascade Campaigns
- As **Dataset Provider** you could:
  - Help us designing new online Cascade Campaign
- As **Sponsor** you could:
  - Support the organization of specific benchmark
  - Support team participation and travels
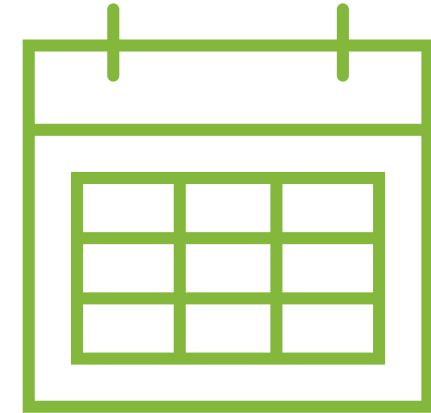 - Sponsor prizes and collateral events
- As **Stakeholder** you could …

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WHAT'S NEXT?

Some **ACRE activities** are already planned

- … we want to hear from you …
- Dec. '20: ACRE presentation @ FIRA
- Feb. '21: 2nd ACRE Workshop & 1st Field Campaign launch
- … consultation …
- June '21: 1st ACRE Field Campaign @ Montoldre (France)
- Sep./Oct. '21: 2nd ACRE Cascade Campaign
- …

Drop us an **email to get updated**: acre@metricsproject.eu

Check **METRICS website**: https://metricsproject.eu/agri-food/

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THANK YOU

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