ICT-AGRI
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ICT-AGRI

Coordination of European Research on ICT and Robotics in Agriculture and Related Environmental Issues

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1. Introduction

The concluding conference of ICT-AGRI was held in conjunction to the ninth bi-annual conference of the European Federation for Information Technology in Agriculture, Food and the Environment (EFITA) in Torino, Italy, June 23-27, 2013.

The conference was organised by EFITA in collaboration with the World Congress on Computers in Agriculture (WCCA) and International Commission of Agricultural and Biosystems Engineering (CIGR).

The focus of the conference was Sustainable Agriculture through ICT Innovation.

The conference attracted 200 researchers predominantly from Europe, but also with representatives from American, Asian and African countries.

The ICT-AGRI conference was included in the conference programme as a separate workshop in the afternoon of the first day after the morning's opening session and before the full programme's concurrent sessions the following days. The ICT-AGRI workshop is reported in details in the following pages.

The coordinators of the seven research projects funded by the first ICT-AGRI transnational call in 2010 had been encouraged to present the results of the projects at the EFIATA conference. Six of the seven projects were presented at the conference. This will be further reported in a section of this paper.

Representatives of ICT-AGRI took part in the general discussions at the conference and there was a keen interest for ICT-AGRI among the conference participants. This will also be reported in this paper.

2. ICT-AGRI Workshop

The workshop took place on June 24 2013, 14:00 – 18:00.

The workshop was organised by Alberto Masci and Iver Thysen.

About 100 of the conference participants joined the workshop.

2.1. Workshop programme

The workshop programme was designed with multiple purposes:

- Information from ICT-AGRI to researchers and developers within ICT and robotics in agriculture
- Views on ICT-AGRI from major stakeholders representing research, manufacturing and the European Union
- Response to ICT-AGRI from the audience

Workshop programme

14:00	**Introduction** *Alberto Masci, ICT-AGRI*
14:20	**ICT-AGRI from outside** *Hans-Jörg Lutzeyer (European Commission)*
14:35	**ICT-AGRI Strategic Research Agenda** *Markus Lötscher, ICT-AGRI*
14:55	**ICT-AGRI-2** *Iver Thysen, ICT-AGRI*
15:30	Coffee brak
16:00	**Meta Knowledge Base - not only a mapping excercise** *Jürgen Vangeyte & Koen Mertens, ICT-AGRI*
16:20	**Public Private Partnership within ICT-AGRI** *Anais Wermeille & Jean Pierre Chanet, ICT-AGRI*
16:40	**Transnational research - ongoing research projects** *Iver Thysen, ICT-AGRI*
17:05	I**CT-AGRI from outside** *Sjaak Wolfert (Wageningen University and Research Center)*
17:20	**ICT-AGRI from outside** *Thilo Steckel (CLAAS)*
17:35	**Wrap-up and conclusions** *Alberto Masci, ICT-AGRI*

2.2. Workshop Introduction

The main purpose of the Workshop was not only to disseminate the results and the achievements of ICT-AGRI, but also to get the feedback of the most relevant stakeholders (European Commission, Industry and Research) to better define the activities of ICT-AGRI 2. So the presentation given had the aim to very briefly show the outcomes of the activities carried out, but mainly to stimulate the discussion with the audience.

2.3. ICT-AGRI from outside – The European Commission

Hans-Jörg Lutzeyer is a senior officer in Directorate General Agriculture and Rural Development and he is and has been responsible for several EU projects relating to ICT and robotics in agriculture. Hans-Jörg Lutzeyer is the project officer in charge of ICT-AGRI-2. He emphasised in his presentation the importance of ICT and robotics as an important element in the development of a greener European agriculture.

Hans-Jörg Lutzeyer presented the new initiatives in Horizon2020 and in particular the European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI). He encouraged the researchers in the audience to take part in these important European initiatives.

Finally, Hans-Jörg Lutzeyer acknowledged the work being done in ICT-AGRI and he congratulated the ICT-AGRI-2 consortium for the positive evaluation of its proposal for a new ERA-NET. His advice for the work in ICT-AGRI-2 was to continue on the lines laid out in the first four years of ICT-AGRI.

2.4. ICT-AGRI Strategic Research Agenda

Markus Lötscher is working in the Federal Office for Agriculture in Switzerland. He was the editor of the ICT-AGRI Strategic Research Agenda published in December 2012.

Markus Lötscher described in his presentation the extensive work in ICT-AGRI concerning the development of the Strategic Research Agenda. This work started with internal discussions and drafting, which provided the basis for an online consultation among ICT-AGRI's stakeholders. The results of this consultation were used in the writing of the final version.

Markus Lötscher then presented and commented the main recommendations of the Strategic Research Agenda:

- Developing ideas from different areas of academic expertise to arrive at innovative solutions
- Achieving maximum profit by combining stakeholder expertise
- Investing in compatible systems in order to utilize the full potential of the technology

2.5. ICT-AGRI-2

Iver Thysen has worked in the ICT-AGRI Secretariat at the Danish Agency for Science, Technology and Innovation from the start of the ERA-NET, and he was a main contributor to the proposal for ICT-AGRI-2.

Iver Thysen underlined that the negotiations concerning ICT-AGRI-2 were in their beginning at the time of the conference. The work programme for ICT-AGRI-2 primarily designed to foster the implementation of the Strategic Research Agenda with an extended focus on innovation. ICT-AGRI-2 will produce three annual Action Plans for implementation of the Strategic Research Agenda and at the end a new and updated Strategic Research Agenda. The development of the Action Plans will be by extensive consultations with actors in the field. The predominant tool will be three annual calls. Further goals for ICT-AGRI are to improve researcher mobility and career, and to support the use of Open Access to agricultural knowledge.

2.6. Meta Knowledge Base - not only a mapping exercise

Jürgen Vangeyte and Koen Mertens are researchers at Institute for Agricultural and Fisheries Research (ILVO) in Belgium. They are both actively involved in ICT-AGRI in particular concerning the development and use of the Meta Knowledge Base.

Jürgen Vangeyte described in his presentation the original intentions of the Meta Knowledge Base as a tool for mapping of organisations and research activities within ICT and robotics in agriculture. The basic idea was to provide an opportunity for researchers to enter information about their research into an online database; the motivation would be a common interest in sharing such information. However, this motivation did not appear to be strong enough for a widespread input of information.

The Meta Knowledge Base developed to host other usages such as online consultation for the Strategic Research Agenda and consortium building and proposal development in connection with ICT-AGRI calls. In this way, the Meta Knowledge Base has attracted more than 1000 registered users, and it has become an important tool for dissemination by e-mail based newsletters.

2.7. Public Private Partnership within ICT-AGRI

Anais Wermeille and Jean Pierre Chanet are researchers at the National Research Institute of Science and Technology for Environment and Agriculture (IRSTEA) in France. Both are actively involved in ICT-AGRI, in particular with the Public Private Partnership (PPP) initiatives.

Anais Wermeille and Jean Pierre Chanet described in their presentation a PPP Action launched by ICT-AGRI in 2011 with the goal to support and develop the set-up of partnerships between public and private stakeholders (public research centers, private companies, end user associations, etc.) in the area of ICT and Robotics for the agriculture and environment. A first specific main challenge

involving all European countries was chosen: the reduction of the use of pesticides, in close relationship with the 2018 European objective (European Directive 2009/128/EC).

The work with the PPP Action revealed the difficulties of establishing contact and collaboration with private companies, especially small and medium sized companies, within ICT and robotics in agriculture. The experiences from the PPP Action show that dedicated efforts within the participating countries are required concerning this very important group of actors.

2.8. Transnational research - ongoing research projects

Iver Thysen presented the main topics in the two ICT-AGRI calls in 2010 and 2012. He showed an overview of seven projects funded by the first call in 2010 and the eight projects funded by the second call in 2012. He also explained the procedures of the calls, including the use of virtual common pots (national funding to national researchers), the requirement of at least three participating countries and the need for added European value.

Then followed a discussion with the audience with contributions from some of the project coordinators, who expressed their satisfaction and extra benefits from research on a transnational scale. The value of the ICT-AGRI Meta Knowledge Base concerning finding new partners in other countries was emphasised. The audience expressed expectations concerning future calls.

2.9. ICT-AGRI from outside – European research

Sjaak Wolfert is a researcher at Wageningen University and Research Centre. He is and has been coordinator of several EU funded projects within ICT in agriculture.

Sjaak Wolfert presented objectives and results from the European projects agriXchange, SmartAgriFood and FI-SPACE. agriXchange was about the exchange of data within agriculture and food. The project has conducted surveys in most European countries, which has provided important information about a lack of data sharing among agricultural ICT providers. The project has also developed a tool concerning data exchange implementations. The results from the project have been collected in a Research Agenda.

SmartAgriFood and FI-SPACE are agriculture and food oriented projects within the Future Internet Public-Private Partnership, which is aiming at a dramatic improvement of European competitiveness within smart Internet based applications.

2.10. ICT-AGRI from outside – European Agricultural Machine Manufacturers

Thilo Stickels is employed by CLAAS, who is a leading international manufacturer of agricultural machines. He is actively engaged in the European Robotics Public Private Partnership (PPP), which is the teaming up of the robotics industry, research, academia and the European Commission to

launch a joint research, development and innovation programme in order to strengthen the position of European robotics as a whole.

Thilo Stickels presented information about the research and development in CLASS with respect to smart computerised machines and robots for agriculture. He furthermore explained the company's and industry's expectations to research within agricultural engineering and to transnational initiatives as for example ERA-NETs.

Thilo Stickels described the objectives and goals of the Robotics-PPP with a particular emphasis of robots for the agricultural domain. He encouraged the audience to be aware of coming Horizon2020 calls with openings for projects concerning robots for agriculture.

2.11. Wrap-up and conclusions

In general, there was a positive and supportive response from the audience to the work done by ICT-AGRI. It has been recognized that the different actions of the ERA-NET are important and in the right direction to strengthen the ICT and robotics in agriculture. However, the discussion also showed the challenging task of bringing together the various actors. ICT-AGRI must improve its visibility but also needs to clearly state the benefit for all actors when it comes to networking. ICT-AGRI can play an important role in recognising the actors and support knowledge transfer and innovation activities.

3. Conference presentations of ICT-AGRI funded projects

The following six projects had presentations in the main conference programme. All projects ended in 2013 and the presentations therefore included nearly final results.

STRATOS	open System for TRAcTOrs' autonomouS Operations
ROBOFARM	Integrated robotic and software platform as a support system for farm level business decisions
PIGWISE	Optimizing performance and welfare of fattening pigs using High Frequent Radio Frequency Identification (HF RFID) and synergistic control on individual level
Predictor	Preparing for the EU Soil Framework Directive by optimal use of Information and Communication Technology across Europe
GeoWebAgri	Geospatial ICT infrastructure for agricultural machines and FMIS in planning and operation of precision farming
3D-Mosaic	Advanced Monitoring of Tree Crops for Optimized Management - How to Cope With Variability in Soil and Plant Properties?

4. ICT-AGRI participation in Conference discussions

The EFITA Conference programme included a 90 minutes Round Table session (open for all participants) concerning EFITA goals towards the future. ICT-AGRI was invited (among others) to provide a short statement at the beginning of the session.

There were remarkable interests and expectations among the EFITA members concerning collaboration between EFITA and ICT-AGRI. From ICT-AGRI it was suggested to create a common Internet resource for agricultural software applications with ICT-AGRI hosting the web site and EFITA members to evaluate and recommend the applications. From EFITA the contributions from ICT-AGRI to the conference were appreciated and interests for repeats of the collaboration at future EFITA conferences were firmly expressed.

5. Conclusions

ICT-AGRI was significantly exposed at the conference through the special ICT-AGRI workshop, the presentations of ICT-AGRI funded projects and the contributions to the forum discussions during the conference. ICT-AGRI has thereby achieved a considerable recognition in the European community of researchers and developers within ICT and robotics for agriculture.

The experiences from this conference - together with experiences from the previous EFITA conferences in 2009 and 2011 as well as other major agricultural conferences – indicate that collaboration with events in the community is a very important method for raising awareness among the stakeholders. It is therefore recommended to continue such efforts also in ICT-AGRI-2.