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Letter of intent for FuturICT

This Letter of Intent reflects the information available at the date of signature. An update will be provided at submission time of the CP-CSA proposal, following the availability of additional information on the call, evolutions in project approvals and further local cofunding negotiations.

Dear Professor Bishop,

As rector of the KU Leuven I would like to express our strongest support for the FuturICT FET Flagship proposal.

FuturICT aims to provide the backbone for a broadly accessible, planetary scale data-analysis and knowledge creation environment. By complementing the generic framework with domain-specific knowledge and data, the system becomes a very interesting tool for analysing complex situations in an almost endless list of societal relevant problem domains that are considered grand challenges of the 21 century: like "climate change and natural resource exhaustion", "crime management", "global health", "financial crises", ... Both scientists in social and economic sciences as well as politicians and decision makers will receive through FuturICT an extremely interesting instrument to guide their work and decisions.

The FuturICT project addresses both the challenge to build a "generic" ICT backbone (consisting of a Planetary Nervous System, a Living Earth Simulator and a Global Participatory Platform) and the challenge to apply the developed technology in concrete economical and societal relevant domains as is reflected in the concept of "observatories". Both challenges are addressed in an interactive way. It is exactly this interplay between on the one hand "ICT and complex systems science" providing the technology and on the other hand the "societal/economical science" providing challenging and relevant "use-cases" for applying and guiding the technological research, that makes up the value and potential of the project.

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Being a comprehensive university, with in total 6,600 researchers in Socio-Economic Sciences & Humanities, in Sciences, Engineering & Technology, and in Biomedical Sciences, with annual research expenses of 347 million euro (2010), this cross-disciplinary type of research perfectly fits with our mission to be strongly inter- and multidisciplinary in focus. The project indeed offers the potential to bring closer together not only different ICT oriented disciplines but also ICT and non-ICT oriented ones.

As a starting point we see within the FuturICT project a lot of research potential for our LICT (Leuven Centre on Information and Communication Technology) members. With about 50 professors and more than 350 researchers LICT brings together research groups from the KU Leuven and its association partners that are active in the area of ICT, being it the hardware, the software or the social and legal aspects of it. LICT research is oriented amongst 7 research lines: "Wireless communication systems", "Mixed signal interface systems", "Embedded systems and software", "Distributed systems", "ICT security and privacy", "Human-machine interaction" and "Knowledge technologies". Most relevant for the FuturICT project are the latter four research lines for which the available expertise, mission and scientific objectives are well in line with the FuturICT project goals. From within these research lines KU Leuven could offer the FuturICT consortium expertise on "information mining and knowledge representation", "(data and system) security and privacy" and "distributed systems software".

In all these domains KU Leuven-LICT members have a strong expertise and (international) track-record, what can be illustrated amongst others by the number of FP7 projects KU Leuven professors are involved in. For example, the LICT research groups that are most relevant for FuturICT participate in 43 FP7-ICT projects, 5 times as coordinator. Worth mentioning are specifically the ERC grants of Prof. Luc Van Gool, Prof Tinne Tuytelaars and Dr. Jan Ramon. Overall KU Leuven is ranked the 5th university in FP7 with up to now more than 350 accepted projects representing a budget of more than 135 Meuro (4th interim FP7 report, Aug. 2011). Research directly related to ICT accounts for over 20% of these projects, biomedical research for nearly 1/3.

In the area of "information mining and knowledge representation", the DTAI (Declarative Languages & Artificial Intelligence) group researches technologies and solutions for advanced data mining and machine learning with focus on networked, relational, possibly uncertain data, as well as the formalised methods for knowledge representation behind it. The group has 63 members among which 10 professors and 19 postdoctoral researchers. A budget1 of

[1] This number reflects the income from approved projects (EU, national, internal) and PhD or postdoc scolarships running in 2013 and beyond. Projects that are still in an evaluation or submission phase are not included.

12,7 Meuro has already been committed in projects that allow to continue research activities in 2013 and beyond.

Multimodal (text, image, video, spoken language) information mining and (intelligent) visualisation are within the focus of the research groups HCI (Human Computer Interaction), VISICS (VISion for Industry Communications and Services), SPEECH, ASRO (Architecture, Urbanism and Planning) and part of SISTA. The researchers focus on the one hand on retrieving information from (combinations of) texts, video, images and speech fragments and on the other hand on representing this information and the derived knowledge intuitively, interactively and adapted to user needs and preferences. Related is also the work of CUO (Centre for User Experience Research) on user oriented design and user experience research. Together these groups contain about 95 researchers among which 11 professors and 19 postdoctoral researchers. A budget1 of 12,7 Meuro has already been committed in projects that allow to continue research activities in 2013 and beyond.

A second area of LICT research of particular interest for the FuturICT program relates to "(data and system) security and privacy" KU Leuven-LICT has a strong reputation on security and privacy research, including cryptography, secure architectures, software and applications as well as privacy. One of the inventors of the Rijndael algorithm, Prof. Vincent Rijmen, e.g. is a member of the COSIC (Computer Security and Industrial Cryptography) group: one of the two LICT groups technically active in this area. Besides for COSIC also part of the DistriNet (Distributed systems and Computer networks) group is active in this domain. Together, the security oriented part of DistriNet and COSIC represent about 95 researchers among which are 10 professors and 22 postdoctoral researchers. Additionally the ICRI (Interdiciplinary Centre for Law and ICT) group of the Faculty of Law focuses on legal aspects of ICT and media technology and counts for 19 researchers including 2 professors and 4 postdoctoral researchers. In total a budget1 of 15,5 Meuro has already been committed in projects that allow to continue research activities on security and privacy in 2013 and beyond.

Finally LICT can offer expertise on distributed software architectures, multi-agent systems, agent-based simulation and large scale collaborative systems from within the distributed systems oriented section of the DistriNet research group. This part of the group represents 36 researchers among which there are 52 professors and 9 postdoctoral researchers. A budget1 of 4,5 Meuro has already been committed in projects that allow to continue research activities in 2013 and beyond.

[2] Two of these professors have activities in both DistriNet sections

Being a comprehensive university, KU Leuven is also a good candidate to link the ICT oriented research to specific application domains as will be done in the framework of building out the FuturICT Observatories. Although KU Leuven has activities in many of the Observatory Domains, there are two specific domains we want to highlight here: "Crime and Fraude" on the one hand and Biomedical Research with"Virology" in particular on the other hand. Within the area of "Crime and Fraude" the LINC (Leuven Institute of Criminology) and the Institute of Criminal Law together represent about 100 researchers (professors and assistants) that are active in the area of criminological research and education. KU Leuven is also founding member of the Belgian Cybercrime centre of excellence for training, research and education (B-CCENTRE), being a collaboration and cooperation platform for tackling cybercrime matters in Belgium. Through this Centre ICRI, DistriNet, COSIC, LINC and the Institute of Criminal Law collaborate with international academic research groups, industry players and public organisations (law enforcement, judges and policymakers) on cybercrime related research and training.

In the domain of Health the "Laboratory of Clinical and Epidemiological Virology" represents 4 professors, 9 postdoctoral researchers and 23PhD students active in the areas of "Clinical Virology", "Evolutionary and Computational Virology" and "Clinical and Evolutionary Virology".

Summarising the above information shows that as of today there is a human capital of about 300 researchers active in FuturICT related ICT domains and an additional 140 researchers in the areas of crime and virology. The total research budget committed so far for the ICT concerned research groups for projects running in 2013 and beyond amounts to more than 45,4 Meuro3.

Being a member of the Flemish supercomputing Centre KU Leuven could possibly also make available for experiments supercomputing capacity.

Next to this in-kind funding (through existing personpower and infrastructure) KU Leuven is also committed to invest with additional funding in the FuturICT project. We are currently investigating the modalities.

Finally it should also be mentioned that (together with the other universities and research centres in Flanders) we are in active negotiation with the Flemish Minister and Funding

[3] An analysis of the committed research budget within the non-ICT "crime" and "health" related research groups has not been performed yet but would add up to the total in-kind KU Leuven matching funds.

organisations to arrange for Flemish co-funding for the FET Flagships. So far the Flemish authorities already committed to participate in the EraNetplus call during the ramp-up phase. The modalities for the full-phase are still under discussion. A Letter of Intent will be made available before the submission data of the FuturICT final report.

Regarding research valorisation, we also want to highlight that KU Leuven can play an important role in bringing the academic research results to industry or society. With the support of the technology transfer office of the university (KU Leuven LRD), about 100 spin-offs have been created since 1972 and about 320 patent families are under full control of the university. Besides, the individual LICT research groups have a good track-record in collaborating with industry both in a national and international contex, including via its Industrial Research Fund and dedicated industrial research managers.

Allow me conclude by repeating my support for the initiative to link the European Research Community around unifying goals in general and around the FuturICT goals in particular.

Should you have further questions concerning my support, please do not hesitate to get in touch.

Prof. Dr. Mark Waer
Rector KU Leuven

Date: 0 8 MAART 2012