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**CITY College**  
An International  
Faculty Of  
The University.

South-East  
European  
Research Centre.



ICT Research  
Track:  
Brief Profile.

## **The South-East European Research Centre**

The South-East European Research Centre (SEERC) is an overseas research centre of the University of Sheffield, established as a non-profit legal entity in Thessaloniki, Greece. The centre was founded by City College, the University's International Faculty, in 2003. SEERC conducts multidisciplinary research in the fields of Enterprise, Innovation & Development, Information & Communication Technologies, and Society & Human Development.

### **Mission Statement**

SEERC's mission is to support the stable and peaceful development of South East Europe by conducting pure and applied research in, and for the region. To accomplish this, SEERC employs the research capacities of different Faculties and Departments of the University of Sheffield, including City College - the University's International Faculty in Thessaloniki, by facilitating collaborations between researchers and by developing multi-disciplinary networks across South East Europe.

The goals of the South-East European Research Centre are:

- To promote independent, objective analysis and public discussion on issues related to the development of South East Europe and provide a forum for researchers in the SEE region.
- To disseminate findings to academics, professionals, NGOs, policy-makers through conferences, advising, published research papers, monographs, and working papers.
- To promote cutting-edge research both within existing disciplines and in the development of multi-disciplinary perspectives through workshops and seminars.
- To assist in the integration of researchers from universities and research centres in the SEE region into networks of excellence.
- To draw PhD candidates from throughout the SEE region to the University of Sheffield and City College and provide them with a rich and rewarding research environment at SEERC.

### **Research at SEERC**

Research at SEERC is organised around four broad areas:

- Research Track 1: Enterprise, Innovation & Development
- Research Track 2: Information & Communication Technologies
- Research Track 3: Society & Human Development: Psychology, Politics, Sociology and Education

Within each of these Research Tracks, SEERC encourages the formation of Research Clusters, each focusing on a specific set of research objectives. In line with the international vision established for the centre, each Research Cluster draws mainly from the researchers of the University of Sheffield and its International Faculty, City College, and actively encourages participation from other universities, research centres and organisations throughout Europe.

## **Information & Communication Technologies Research Track**

Through the Research Clusters that are active in the Information and Communication Technologies (ICT) Research Track, SEERC fosters collaboration mainly among researchers from the University's Departments of Computer Science at the International Faculty and the Faculty of Engineering, and the Information School. In addition, research topics of interdisciplinary and multidisciplinary nature are investigated in collaboration with researchers from the Management School, the Informatics Collaboratory of the Social Sciences (ICOSS), the Centre for Inquiry-based Learning in Arts and Social Sciences (CILASS), the Department of Geography, and the Department of Business Administration & Economics at City College. In parallel, the ICT Research Track actively promotes collaboration with a great number of research institutions and organisations from the region of South East Europe and beyond.

### **Research Clusters in the ICT Research Track**

Within the Information and Communication Technologies Research Track, the following Research Clusters are currently active:

- Intelligent Systems Research Cluster
- Software Engineering & Service-Oriented Technologies Research Cluster
- Information & Knowledge Management Research Cluster

### **Research Expertise of the ICT Research Track**

Members of the Information and Communication Technologies Research Track have a research record in the areas of:

- Formal Methods: Formal Specification Languages, Modelling and Model Checking for Safety Critical and Large Scale Systems, Formal Verification and Testing of Software Systems
- Artificial Intelligence: Multi-Agent Systems, Biologically Inspired Computation, Parallel Logic Programming, Constraint Logic Programming, Neural Networks , Semantic Web Technologies
- Software Engineering: Service Oriented Computing, Web Service Technologies, Cloud Computing, Software Engineering Processes, Agile Software Development, Object-Oriented Analysis and Design
- Educational Informatics: Virtual Learning Environments, Networked and Ambient Learning, Learning Management Systems, Multiple Teaching Strategies
- Health Informatics: Electronic Health Records, Health Information Management, Affective and Physiological Computing
- Information Systems: Analysis, Design, and Management of IS, Business Information Systems, Geographical Information Systems, Information Security, IT Policy and Socio-Economic Effects

## Funded Research Projects of the ICT Research Track



**Broker@Cloud:** Enabling Continuous Quality Assurance and Optimization in Future Enterprise Cloud Service Brokers

Duration: 01/11/2012 - 31/10/2015

Funding: FP7 - ICT

SEERC budget: 557.000 €

As enterprises increasingly adopt the model of cloud computing, their IT environments are transformed into a matrix of interwoven infrastructure, platform and application services delivered by multiple providers. To deal with the complexity of consuming large numbers of cloud services from diverse sources, enterprises will need assistance from specialised cloud service brokers. In Broker@Cloud, we envisage developing a brokerage framework which will allow cloud intermediaries to equip their platforms with advanced methods and mechanisms for continuous quality assurance and optimization of software-based cloud services. Those software-based services can range from simple programmatically-accessible web APIs, to complex software applications delivered as cloud services, i.e. on-demand Software-as-a-Service offerings. Employing the capabilities of the Broker@Cloud framework will provide future cloud intermediaries with advanced means of monitoring both the obligations of cloud service providers towards consumers, as well as the opportunities for optimising the services each consumer receives.

Project website: <http://www.broker-cloud.eu/>



**ICT-KOSEU:** Supporting Dialogue and Cooperation between Europe and Kosovo (under UNSCR 1244) in Collaborative ICT R&D

Duration: 01/01/2012 - 31/12/2013

Funding: FP7 - ICT

SEERC budget: 79.179 €

ICT-KOSEU aims at supporting Kosovo's efforts for inclusion to the European Research Area by strengthening its capacity to participate to FP7 ICT research and by facilitating its ICT researchers' collaboration with researchers in the EU. This will be done by: enhancing Kosovo's ability to develop an ICT research strategy in line with the local capacity and needs, the state of the art and the priorities set by ERA; implementing this strategy, for the benefit of businesses, government/administration and the citizens of Kosovo; creating wide spread understanding of European ICT research and its need for competitiveness, social welfare and the integration with the European Union; and raising the level of Kosovo to that of the other Western Balkan countries, and in the long run to that of the countries of the European Union, with respect to their participation in the FP ICT program. The partnership includes at the local level representatives of the "triple-helix" of ICT research in Kosovo, while participants from neighbouring Greece, Bulgaria and Italy bring in their experience working in ICT research as well as working with stakeholders in the WBC environment.

Project website: <http://www.ictkoseu.eu/>



**RELATE-ITN:** Trans-European Research Training Network on Engineering and Provisioning of Service Based Cloud Applications

Duration: 01/03/2011 - 28/02/2015

Funding: FP7 People (Marie Curie)

SEERC budget: 618.672 €

Cloud computing is bringing about a paradigm shift in our ways of computer usage and is leading to novel challenges and opportunities for the software industry. It becomes apparent that a new field with tremendous potential for industrial exploitation is emerging, in which Europe needs to establish excelling research. Timely and focused education of researchers in this area is therefore an essential pre-requisite. RELATE is an FP7 Marie Curie Initial Training Network (ITN) providing an opportunity for researchers who are in the first five years of their careers the opportunity to join established research teams that are active in the field area of cloud computing, improve their research skills and enhance their career prospects. Through specialised training modules and dedicated actions (workshops, seminars, summer schools) the 21 research fellows to be recruited by the 7 partners of the ITN will be exposed to cutting-edge developments in the field of cloud computing technologies, but will also obtain skills and competences in important topics such as research management, intellectual property rights, and exploitation of R&D results.

Project website: <http://www.relate-itn.eu/>



**MORMED:** Multilingual Organic Information Management in the Medical Domain

Duration: 1/3/2010 - 30/9/2012

Funding: CIP ICT Policy Support Programme

SEERC budget: 455500 €

The broad adoption of Web 2.0 technologies in the e-health domain has led to the emergence of the term “Medicine 2.0” for relevant applications, services and tools. Web 2.0 applications have contributed towards bringing geographically dispersed groups of people with common interests together. Nevertheless, language remains an essential barrier. People with a wealth of knowledge to share, and willingness to participate, cannot become members of an online community unless they master the official language of the community and of the software platform that supports it. This is a great impediment to the effective dissemination of valuable knowledge, particularly in areas where information is very scarce, such as rare diseases. MORMED attempts to address this challenge by developing a multilingual social networking and content management platform. The platform will combine the semantically-enhanced social networking and content management OrganiK platform with technologies enabling machine translation and post-editing by human experts to make content available in multiple languages. MORMED will be piloted in a community interested in Lupus or Antiphospholipid Syndrome, involving researchers, medical doctors, general practitioners, patients and support groups.

Project website: <http://www.mormed.eu>



**CAST:** Enabling Customisation of SaaS Applications by Third parties

Duration: 1/1/2009 - 31/12/2010

Funding: EUREKA Eurostars

SEERC budget: 320000 €

Software as a Service (SaaS) is a new software delivery model that revolutionises the way in which software is being designed, developed and consumed. The core idea in SaaS is that applications are not installed at a user's premises, but hosted remotely, accessed over the Internet, and priced on a per-user basis. An important feature that is lacking from today's SaaS provision platforms is the ability to sufficiently customise SaaS offerings in order to address the needs of specialised business domains. The introduction of configurability and extensibility in SaaS offerings is a pressing requirement in the SaaS market. Conversely, the development of SaaS platforms that allow for full customisation and extensibility without compromising reliability and security is recognised as a major challenge. The aim of CAST is to develop a customisation framework consisting of a reference architecture, methodological support, and a suite of tools supporting the provision of highly customisable and reliable SaaS offerings.

Project website: <http://www.cast-project.eu/>



**ICT-WEB-PROMS:** Promoting ICT cooperation opportunities and policy dialogue with the Western Balkan Countries

Duration: 1/1/2009 – 31/12/2010

Funding: FP7 - ICT

SEERC budget: 40150 €

The project ICT-WEB-PROMS aims at supporting the establishment of the European Research Area (ERA) in the Western Balkan Countries (WBC), and turning organizations of this region into creators of ICT. Its key objectives are: (1) networking of Western Balkan and EU countries in the area of ICT, (2) increasing the capacity of organizations from Western Balkan countries to create ICT technology and participate in the FP7 ICT programme, (3) creating a supporting project environment and tools that are sustainable, (4) contributing to the implementation of ICT and information society strategies in the Western Balkan countries and supporting EU policy for co-operation with the WBC. The expected results include a network of WBC organizations interested in participating in FP7/ICT research, augmented by domain-specific focus groups, a web portal offering networking possibilities that will be maintained beyond the duration of the project, and material for training on technology and FP7 programme aspects.

Project website: <http://www.ict-web-proms.eu/>



**ELEVATE:** Integrating Pedagogically-Documented, Value-Added E-Training Add-ons in Commercial Software

Duration: 1/10/2008 – 30/9/2010

Funding: FP7 - Research for the benefit of SMEs

SEERC budget: 200000 €

ELEVATE proposes the development of a hybrid training and certification environment that integrates the application software to be taught in a pedagogically-documented educational process, allowing software developing SMEs to deliver innovative e-training services and to address the needs of their business partners and customers. Since software development SMEs have restricted resources to allocate in R&D activities with regard to secondary corporate objectives, including e-training in the produced application software products, the proposed ELEVATE project provides the participating SMEs with potential and financial support to outsource a critical mass of RTD activities to research performing companies and universities with larger research capacity and proven, successful experience in European-wide R&D initiatives. To achieve the project's intended objectives ELEVATE RTD performers will undertake challenging research activities on behalf of the participating SMEs and deliver technology know-how in the fields of e-learning, educational content aggregation and material creation, learning management system and application software integration, and pedagogic standards and models.

Project website: <http://www.elevate-project.eu/>



**Embed4Auto:** Model-based development of embedded software for the automotive sector

Duration: 1/10/2008 – 30/9/2009

Funding: Leonardo da Vinci programme

SEERC budget: 76671 €

By 2010 the number of lines of code in an average car is expected to exceed 100 Million. The number of concurrent software systems and Engine Control Units (ECUs) in cars is constantly growing, from 10-15 ECU in 1995, to nearly 100 ECU in 2007. The engineering of embedded systems is no longer based on classical hardware engineering but on software systems engineering. With a rising level of abstraction necessary to handle such complex systems of hardware and software, model-based technologies have been developed in the last few years to reduce complexity and make the development of such systems more efficient and more failure resistant. Currently, those technologies are waiting to be adapted on a larger scale. The project Embed4auto will provide the European industry with innovative training for model-based development and help to promote the use of model-based technologies in the area of embedded systems development. The project will lead to new technology enhanced VET offers for companies and employees in the area of embedded systems engineering and qualify them to apply model-based technologies in their daily work.

Project website: <http://www.embed4auto.org/>



**OrganiK:** An organic knowledge management system for small European knowledge-intensive companies

Duration: 1/9/2008 – 31/8/2010

Funding: FP7 - Research for the benefit of SMEs

SEERC budget: 228000 €

Small European companies compete on the basis of their know-how and hence need to utilize knowledge to their advantage. They are constrained by scarcity of resources and they thus need to do more with less. Knowledge management systems used by large organisations tend to be expensive, relatively inflexible and unsuitable for European SMEs. Traditional knowledge management usually focus on top-down, rigid and tightly controlled knowledge repositories. The increasing need of European knowledge-intensive SMEs for loosely-coupled collaboration, ad hoc knowledge sharing and utilisation, and open innovation structures, has led to a strong requirement for a next generation knowledge management system that manages and promotes social structures. OrganiK will combine social software applications and semantic technology in order to develop an innovative knowledge management approach for European SMEs. The project will deliver a set of semantically-integrated social software tools, a well-tested and documented methodology for their application, and a set of five reference applications in use at the participating SMEs which initiated this ambitious project.

Project website: <http://www.organik-project.eu/>



**S-Cube:** Software Services and Systems Network of Excellence (Associate Partner)

Duration: 1/3/2008 - 29/2/2012

Funding: FP7 - ICT

S-Cube, the Software Services and Systems Network, is an FP7-funded Network of Excellence that aims to establish an integrated, multidisciplinary, vibrant research community which will enable Europe to lead the software-services revolution, thereby helping shape the software-service based Internet which is the backbone of our future interactive society. An integration of research expertise and an intense collaboration of researchers in the field of software services and systems are needed to address the fragmentation of research within the related communities (e.g. software engineering, grid computing), and to address important engineering challenges of the future, such as development of service-based systems with the ability to self-adapt while guaranteeing expected levels of service quality. SEERC joined the S-Cube Network of Excellence as an Associate Member in January 2010, and will collaborate with other members of the network on joint research activities in the domain of service-based systems engineering and adaptation, run-time quality assurance and quality prediction, and self-\* service and grid infrastructures.

Project website: <http://www.s-cube-network.eu/>



**WBC-INCO.NET:** Co-ordination of Research Policies with the Western Balkan Countries

Duration: 1/1/2008 - 31/12/2011

Funding: FP7 - Capacities / International Cooperation

SEERC budget: 37000 €

WBC-INCO.NET is designed to become a major strategic project to supporting the cooperation between the EU, countries associated to FP7 and the Western Balkan Countries (WBC) in the field of Science and Technology (S&T). The project addresses all of the issues of bi-regional dialogue laid down in the call for proposals at the highest stakeholder level with a strong operational implementation basis. It aims to produce tangible results and generate a high structural impact. The three most central objectives of WBC-INCO.NET are (1) to support the bi-regional dialogue on S&T by benefiting from an efficient division of labour within the Steering Platform on Research between the EU and the WBC; (2) to identify RTD priorities and RTD potentials in the WBC in a transparent and methodologically sound way, preparing for eventual take-up in forthcoming work programmes and FP7 calls; (3) to enhance the participation of researchers from the WBC in European projects of interest by implementing capacity building measures on a structural (horizontal) and individual (i.e. research entity) level, and by tailor-made networking activities.

Project website: <http://www.wbc-inco.net/>



**eSDI-NET+:** Network for promotion of cross-border dialogue and exchange of best practices on Spatial Data Infrastructures throughout Europe

Duration: 1/9/2007 – 31/8/2010

Funding: eContentplus Programme

SEERC budget: 10500 €

The objectives of eSDI-NET+ is to target users and bring together key European SDI stakeholders through a Thematic Network - a platform for communication and knowledge exchange at all levels, from local to global. Through the promotion of high-level decisions and technical discussion, the network will help to raise awareness of the important role SDIs play in the enrichment and reuse of GI. In addition, eSDI-NET+ will tackle the multicultural and multilingual barriers to accessing, exploiting, using and reusing GI. As a result, greater steps will be made towards interoperability through the expression of common standards between national digital collections and services, especially in cross-border contexts. By defining and identifying examples of best practice, eSDI-NET+ will integrate expert perspectives from across Europe to create synthesised SDI guidelines and standards. Through the network's membership, the gap between local and European levels will be narrowed, helping to support the better use of GI found in pan-European initiatives such as INSPIRE, GMES and GALILEO. By mobilising such expertise, eSDI-NET+ offers the means to catalyse new initiatives, actions and services, maximising the potential of GI and the communities it supports.

Project website: <http://www.esdinetplus.eu/>



**J-WEB:** Collaboration environment for Judicial European network in Western Balkans  
Duration: 1/2/2007 – 1/5/2009  
Funding: FP6 – Information Society Technologies  
SEERC budget: 93500 €

J-WEB aims at designing and developing an innovative judicial cooperation environment to enable an effective judicial cooperation specifically in the cross-boarder criminal matters investigation phase carried out between EU and Associate countries. The project focus is on the development of a framework designed to support the judicial operators in their daily duties on the two main procedures preceding the request for warrant of arrest. J- WEB will be built on Web-based groupware tools supporting collaboration and knowledge sharing among geographically dispersed workforces, within and between law organisations. It will represent the convergence of technologies such as multimedia document/image management, videoconferencing, in compliance with security requirements, helping public administrations transcend all sorts of boundaries (geography, time and organisational structure), making the right information available to the right actor at the right place and at the right time.

Project website: <http://www.jweb-net.com/>



**FUSION:** Business Process FUSION based on Semantically-enabled Service-Oriented Business Applications  
Duration: 1/2/2006 – 31/7/2008  
Funding: FP6 – Information Society Technologies  
SEERC budget: 325594 €

SMEs cooperating with international partners in the enlarged Europe need holistic Enterprise Applications Integration (EAI) solutions in order to operate their e-business effectively. At the same time they are facing intercultural barriers, since current interoperability and integration efforts are more focused on "data" of the systems rather than on "processes". FUSION aims to promote efficient business collaboration and interconnection between enterprises (including SMEs) by developing a framework and innovative technologies for the semantic fusion of heterogeneous service-oriented business applications. The FUSION research project is led by SAP AG and a consortium consisting of 14 partners from five European countries (Germany, Poland, Greece, Hungary, Bulgaria), including Research Institutes, Technology Developers, Innovation Transfer bodies as well as end users.

Project website: <http://www.fusion-strep.eu/>



**SWIM:** Development of an Intelligent System for the Management of Semantic Web Services

Duration: 1/11/2005 - 31/10/2008

Funding: Hellenic General Secretariat for Research and Technology (GSRT) - PENED-2003

The aim of this project is the development of an intelligent Web services management system. This system will serve as a central node for automated discovery, collection, distribution, composition and control of Web services, whose characteristics will be described using ontologies and semantic metadata. The proposed system can constitute the infrastructure for a variety of intelligent Web applications and services in the domains of e-commerce, e-learning and e-government. One of the main targets of the project is the development of a pilot e-commerce platform on top of SWIM, through which the usability of the latter will be evaluated. SWIM will consist of a number of subsystems supporting ontology management and rule-based reasoning, planning for Web services composition, agent-based search and collection of Web service information and metadata, and machine learning for Web service management and QoS control.

Project website: <http://lpis.csd.auth.gr/projects/pened/>



**Embedding Standards:** Embedding ICT and Multimedia Standardisation Initiatives into European Vocational Training Development Strategies

Duration: 1/11/2004 – 30/11/2006

Funding: Leonardo da Vinci programme  
SEERC budget: 23570 €

Transfer of qualifications and competences is an increasingly important priority for European cooperation in the field of education and training. To promote mobility within the European Union, transfer refers to the portability of qualifications and/or competences between learning contexts (formal, non-formal etc.), levels of education and training (initial, continuing, higher etc.) and settings (national, sectoral, regional, local). To support the transfer of qualifications and competences, it is essential to link together different contexts, levels and settings of education and training, enabling individuals to build on and combine learning outcomes. For that reason, the Embedding Standards project intends to support European standardisation processes in the ICT and multimedia sector, to deliver better acceptance and possibilities of anchorage of European standards in national environments.

Project website: <http://www.embedding-standards.com/>



**Ambient Learning:** Ambient, Multimodal and Context-sensitive Lifelong Learning

Duration: 1/8/2004 - 31/1/2006

Funding: FP6 - eTen

SEERC budget: 240000 €

The objective of the project is to provide a pragmatic, easy-to-use eLearning service, which allows any time, any where and any how access to personalised, high quality learning content. The AMBIENT LEARNING service offers ambient, multimodal, personalised and context-sensitive access to learning at work, at home, at a training institution or on the move. The main distinguishing features of the AMBIENT LEARNING services to other eLearning approaches are the following: a) Multimodal Broadband Access which allows the user access to eLearning objects any time, any where and any how. b) Context Management enables the provision of eLearning objects based on the context of the user. c) Content Integration allows access to existing knowledge catalogues and eLearning resources. The ambient eLearning service will form a real trans-European service and after the successful completion of the market validation the service will be available at an affordable price per user in order to support the European citizens.

Project website: <http://www.ambientlearning.net/>



**EPOS:** e-Procurement Optimised System for the Healthcare Marketplace

Duration: 1/6/2004 – 31/12/2005

Funding: FP6 – eTen

SEERC budget: 178000 €

EPOS is using Web-based technologies to reduce time, cut transaction costs, and boost the overall efficiency of the public healthcare supply network. It also addresses successfully the security, trust and confidence issues of secure transactions between public healthcare institutions and private medical vendors, since the e-Procurement application proposed relies on multiple levels of suppliers to sustain its purchasing function. Additionally, EPOS deals with interconnection and interoperability issues, using proven web-based technologies. The project intends to establish a pan-European service for e-procurements in the healthcare sector. The application supports product searches between a multitude of merchandise and a big number of suppliers. In this way cost and time of search are minimized as compared to the traditional way of having to publish a written, official auction sale with lots of paperwork incorporated.

Project website: <http://www.eposproject.com/>



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