Research

The purpose of our Center is to join enough different research groups, resources and tools to support the advance, development and innovation in the ICT field.

Lines of research

Human Language technology (Natural Language Processing)

SINAI group focuses its research in the Human Language Technology field, which encompasses a broad application ensemble very interesting for the information needs of the society. Currently, SINAI offers a wide knowledge about relevant tasks like Information Retrieval, Information Access, Multilingual Information Technologies, Georeferenced Information Retrieval, Multimodal Information Processing and Sentiment Analysis. This knowledge is endorsed for a large of successful projects made by this group in the tourism, social inclusion, educational, and Sentiment Analysis framework.

Intelligent System Based on Fuzzy Decision-Making

SINBAD² group focuses its research on intelligent systems development that help to come to a complex decision for problems that present uncertainty, inaccuracy or ambiguity. Other line of research focuses in personalized e-commerce systems, developing marketing services that satisficed the user individual needs by a recommender system with georeferenced services. Also, a new active line is the development of evaluation methods which are adapted to the evaluator knowledge and subjectivity and the evaluation process purpose. These systems encompass from performance evaluation to sensory evaluation and energy policies evaluation.

Wireless Sensors Network

Multimedia & Multimodal Processing (M2P)

The main research line of M2P group is the multimodal information treatment. One of the essential objectives to pursue is to improve the information exchange caused by human-machine interaction, based on the integration of new information modalities, result exploitation from the fusion of different sensorial sources or the feature extraction that allow advanced artificial intelligence procedures. Since its establishment, our research group is focused on the application of these techniques for video conferencing intelligent systems and social robotics.

Distributed and Collaborative Processing of Audio Signals

The experienced advances in the distributed computing, together with hardware-software available for it, allow to development processing systems of audio signals more powerful, whose interaction with the environment is produced by numerous transducer combinations. Examples: human-machine interfaces based on audio and voice signals, sound field and auralization control systems, audio source location and tracking systems, presence systems, etc.

In the current research line, we tackle the problem of distributed and collaborative audio signals. The physical, computing, signal processing, technology and energy consumption aspects in distributed and collaborative scenarios are considered in this line. The research is focused on a specific applications combination with socioeconomic interest and potential transfer. For each one of those applications is necessary to study the relevant audio information type that will be exchanged on nodes and how to code it, what distributed algorithm has to be used, just as what processing type must be used for each node to make the system computationally efficient and technologically manageable.

Modelling and optimization in Computational Intelligence systems

SIMIDAT research group is working on algorithms development for system modelling and optimization based on Computational Intelligence technics, in particular mono-objective and multi-objective evolutionary and coevolutionary algorithms, neuronal networks and system based on fuzzy and hybridisation rules.

Fuzzy systems integration in devices with restricted resources

The integration pretends to use fuzzy systems based on rules in devices equipped with 8 bits microcontrollers, small memory size, low information processing capacity and specific communications for a low electric consumption. In addition, we are working on specific cloud computing platforms for IoT. Currently, the work line is being applied in different fields such Internet of Things (IoT), wireless sensor networks, and Smart cities.

Cartographic Engineering

The research group in Cartographic Engineering (GiiC) was created in 1997, since that moment the group was part of an Andalusian Research Plan (PAI). In this plan the group is focused on paper or in the Production Technologies area (catalogue code “TEP-164”).

It conforms a living and autonomous structure that allow the collaboration and aggregation of the efforts of all members to get better results and an enough criticism mass to address far reaching R&D projects.

Research lines

- Applications from the GIS to the cartography, environment and management.
- Quality and control of process in cartography.
- Rustic, urban and special cadastre.
- Cartographic production (generalisation, modelling, optimization).
- Software development, artificial intelligence applications for cartography.
- Remote sensing (multispectral, hyperspectral, thermal), applied to the agriculture and engineering.

Computer Graphics and Geomatics

The work lines include Computational Geometry, Geometric Modelling, Solid Modelling, Advanced Applications of Computer Graphics, and Design and Implementation of Spatial Information Systems.

Big Data and Deep Learning

SIMIDAT research group focuses its investigation in the Data science field. The different work lines are: Predictive Analytics, Descriptive Analytics, Data Preprocessing and Visualization. Currently, we have added to these work lines the Data Mining in Big Data and Deep Learning environments.