# Special session on
# Cognitive systems for software defined environments

With the increasing availability of software defined devices (IoT), and potential applications that make use of data from such devices, there is a need to better identify appropriate data processing techniques that can be applied to this data. The computational complexity of these applications, and the complexity of the requirements on the engineering workflows, often derive from the capabilities of current devices and the need to integrate data streams which result in larger data sizes and loads on the computing infrastructure. Furthermore, due to the dynamics and uncertainties of software defined environments, it is essential that these techniques are capable of adapting across a range of computational and data transfer requirements (such as execution performance) and infrastructure scales (processing nodes, storage needs, network requirements) to carry out a particular analysis task, in response to changing requirements and constraints. In general, software-defined environments (SDEs) have the ability to optimize the entire computing infrastructure – compute, storage and network resources – so that it can scale to the network edge and adapt to the type and complexity of emerging workflows.

With the recent technological developments, it has become possible to integrate such software defined environment networks with cognitive systems where applications can use such an intelligent infrastructure to carry out data analytics, process optimisation and decision support. Cognitive systems represent methods and technologies that use language processing mechanisms and machine learning techniques to enable people and machines to interact more naturally to extend and magnify human expertise and cognition. These systems will learn and interact to provide expert assistance to users and other professionals adequately based on predefined objectives. In the smart building scenario, cognitive systems can be deployed on a set of software defined networks and can facilitate building behaviours, reasoning, adaptive reactions and an overall autonomy.

With such a SDE based cognitive system environment, several interactions between the different sensors, devices, actuators, and controllers are facilitated, leading to the creation of "intelligent" collaborative systems which have embedded monitoring and controlling equipment and the potential to optimize various objectives along with operations and maintenance expenses. In the software defined buildings scenario, for achieving an equilibrium in terms of consumption and comfort, these systems typically necessitate the deployment of a wide range of sensors (e.g., temperature, CO2, zone airflow, daylight levels, occupancy levels, etc.), which are, in turn, integrated through an Energy Management Control System (EMCS) and an array of electronic actuators, terminal unit controllers to process sensor outputs, and control set-points. In this particular example, software defined building based cognitive systems can enable building to reason and react with reaction triggers by the use of cognitive processes enriched with energy simulations and optimisation, enabling users to optimize various associated aspects of building use over time.

**Topics of interest include, but are not limited to:**

- **Software defined environments (SDE) supported cognitive systems:Architecture, Middleware and Services**
  Architecture for software defined environments based cognitive systems; Programming models; Application development; Scenario use cases and examples; Requirements analysis and modelling; Service integration; Knowledge generation, Management and semantics; Cloud based software defined environments, Mobile based software defined environments, Big data, Edge clouds.
- **Data analytics and knowledge generation in SDE based cognitive systems**
  Artificial Neuronal Network, Genetic Algorithms, Datamining; Data analytics; Querying and searching; Tools and technologies of data; Data consistency and availability; Data models, Rule based systems, Semantisation and Ontologies.
- **Performance evaluation and optimisation in SDE based cognitive systems**
  Performance modelling in software defined environments; Evaluation techniques; Performance monitoring; Scheduling and application workflows; Accuracy, Scalability, Flexibility and Elasticity.
- **Approximation techniques in SDE based cognitive systems**
  Neuronal network approximation techniques; Simulation approximation techniques; Optimisation approximation techniques, Memory based approximation techniques.
- **Applications for SDE based cognitive systems**
  Software defined buildings,Tools and technologies for SDE cognitive systems; Cost models for SDEs cognitive systems; Applications for energy, materials, buildings, water supply, environment, transportation.

**Section organizers**

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**Submission procedure:** Papers accepted for this session are included in the main conference and follow the same reviewing process.

**Important dates:**

- Abstracts: 12 Mar 2018
- Full paper: 2 Apr 2018
- Acceptance notification: 18 May 2018
- Camera ready: 28 May 2018

Acceptance of papers is based on the **full paper** (up to 8 pages). Each paper will be evaluated by three members of the International Program Committee. However, prospective authors should submit a short abstract in advance, in order to check if the proposed topic fits within the conference scope.

When submitting on the web site, you have to indicate the name of the special session.
Submission on: www.pro-ve.org, with copy by email to the chairs of the special session.