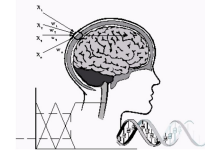




# International

Innovation in Knowledge Based and Intelligent  
Engineering Systems



## INVITED SESSION SUMMARY

KES 2022, Verona, Italy, 7<sup>th</sup> – 9<sup>th</sup> Sep. 2022

**Title of Session: Feature interpretability in visual recognition**

**Name, Title and Affiliation of Chair:**

Chair:

**Dr. Silvia Cascianelli,**

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Co-Chair:

**Prof. Francesco Bianconi,** Department of Engineering, Università degli Studi di Perugia, Italy  
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Co-Chair:

**Prof. Claudio Cusano,** Department of Electrical, Computer and Biomedical Engineering, Università degli Studi di Pavia, Italy  
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Co-Chair:

**Prof. Anne Humeau-Heurtier,** Laboratoire Angevin de Recherche en Ingénierie des Systèmes (LARIS), Université d'Angers, France  
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Co-Chair:

**Prof. Paolo Napoletano,** Department of Informatics, Systems and Communication, Università degli Studi di Milano-Bicocca, Italy  
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**Details of Session (including aim and scope):**

Feature extraction for visual recognition has undergone major changes in recent times. During the last ten years, in particular, Convolutional Neural Networks (CNN) first, and then Fundamental models, have been progressively replacing the traditional approach – that is, feature engineering. It is largely accepted that these models, when properly trained, can achieve better accuracy than hand-crafted methods; however, this comes at the cost of little or no interpretability of the visual features generated.

Explainability methods are being investigated in an attempt to fill the performance-interpretability gap, but their development happens at a much slower pace than task-oriented models. The resulting lack of explainability (‘black-box’ approach) raises important concerns in terms of:

- *Accountability* (who is responsible for the decision making);
- *Perception* (ability of the user to interpret and understand the data);
- *Provenance* (willingness of the user to accept the results of an algorithm).

All these issues represent major obstacles in some applications, as for instance medical image analysis. More generally, it is worth asking whether pushing performance is worth the risk of creating overcomplicated, difficult to interpret and possibly unstable solutions/technologies.

(continued overleaf)

In this scenario, the aim of this special session is to provide a forum to discuss theoretical aspects and practical implications of the performance vs. interpretability dilemma in visual recognition. We welcome contributions in terms of research articles, reviews, position papers and comparative evaluations.

Topics of interest include, but are not limited to:

- Feature extraction for visual recognition: traditional methods, deep learning and hybrid approaches;
- Interpretability of visual features;
- Domain adaptation, robustness and data dependency of visual descriptors;
- Comparative evaluations and benchmarks;
- Applications (Cultural heritage, Industrial inspection, Medical image analysis, Robotics).

Keywords

Visual recognition, Feature interpretability, Colour, Texture, Deep Learning, Domain Adaptation.

Deadlines and submission

As per the main conference (<http://kes2022.kesinternational.org/index.php>)

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