

Title:

A tutorial on multimodal video analysis for understanding human behaviour

Abstract:

This tutorial aims to equip participants with the tools and best practices needed to design, conduct, and interpret experiments that use multimodal video analysis from basic recognition to more complex analysis of social behaviour and emotions.

Learning objectives:

The participants in this tutorial will gain knowledge on the possibilities of multimodal learning for human behaviour understanding. More specifically, they will learn about: (i) possible modalities to consider when analysing the behaviour of a person, (ii) publicly available datasets with their advantages and challenges, (iii) multimodal fusion techniques and approaches for the analysis of behavioural data from videos.

Overall, this tutorial will introduce the field of multimodal video analysis for human behaviour understanding, covering technical aspects and practical applications. Lastly challenges and opportunities in this field will be discussed.

Keywords:

Computer vision; Video analysis; Pattern recognition; Assistive systems; Human behaviour analysis; Emotion recognition; Action recognition; Egocentric perception

Program outline (3h):

[9.30 - 10.45] Part I: Motivation, resources and research trends

- Agenda of the session
- Motivation and historical background
- Publicly available datasets: images vs videos
- Main lines of research in multimodal human behaviour analysis

[10.45 - 11.15] Coffee Break

[11.15 - 12.30] Part II: Frameworks for human behaviour analysis

- Body pose and skeletal trajectory estimation
- Facial emotion analysis
- Wearable devices for egocentric data capturing
- Action recognition
- Example applications
- Conclusions

Characterization of the potential target audience for the tutorial, including prerequisite knowledge and estimated number of attendees

The target audience comprises researchers and students who are interested in the field of human behaviour analysis for assistive computing. Researchers who work on computer vision and machine learning will broaden their knowledge by learning about different applications and opportunities in the field of human behaviour analysis. This tutorial will equip students with the fundamental knowledge to start exploring the exciting world of video analysis.

A brief resume of the presenter(s), which should include name, title, affiliation, e-mail address, background in the tutorial area, example of work in the area (e.g. publications and/or industrial work).

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I work on egocentric vision, computer vision developing tools for understanding human behaviour through the analysis of time series describing a first-person (egocentric) view of the experiences.

List of relevant publications:

- A. Glavan, E. Talavera, “InstaIndoor and multimodal deep learning for indoor scene recognition”, Neural Computing and Applications, IF 5.6, Q2, 2022.
- A. Glavan, A. Matei, P. Radeva, E. Talavera, “Does our social life influence our nutritional behaviour? Understanding nutritional habits from egocentric photo-streams”, Expert Systems with Applications, IF 5.452, Q1, 2021.
- E. Talavera, N. Petkov, P. Radeva, “Egocentric vision for behavioural understanding”, Book Chapter Wearable Sensors: Fundamentals, Implementation and Applications, 2021.
- E. Talavera, C. Wuerich, N. Petkov, P. Radeva, “Topic modelling for routine discovery from egocentric photo-streams”. Pattern Recognition, IF 7.196, Q1, 2020.

<https://estefaniatalavera.github.io/publications/>