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Published: 21/11/2022

Document Version
Peer reviewed version

[Link to publication on the UWS Academic Portal](#)

Citation for published version (APA):

Olszewska, J. I. (2022). *Building intelligent and autonomous vision systems*. XII Brazilian Symposium on Computing Systems Engineering, Fortaleza, Brazil.
https://sbesc.lisha.ufsc.br/sbesc2022/Keynote+Speakers#Joanna_Olszewska

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Building Intelligent and Autonomous Vision Systems

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Nowadays, the rise of smart applications (e.g. smart agriculture, smart manufacturing, smart cities, e-education, e-health, etc.) boosts the development of innovative IT technologies based on Artificial Intelligence (AI), leading to intelligent and autonomous systems, which themselves use new algorithms, complex software, or advanced embedded systems. In particular, intelligent vision systems (IVS), which are systems able to automatically process visual inputs such as raw still pictures or live video feeds, whatever they are equipped with camera(s) or directly access image databases, have become ubiquitous in our Society, from smart lifts to collaborative robots. Therefore, intelligent vision systems must be both efficient and ethical. Indeed, due to their expanding number and range of applications as well as their growing autonomy, there is an increased expectation for these intelligent technologies to involve explainable algorithms, dependable software, transparent agents, trustworthy systems, etc. Hence, this keynote will present both scientific research and societal challenges as well as technical solutions and emerging standards to build trustworthy intelligent vision systems to be deployed in real-time and in real-world, constrained and unconstrained environments, in the context of Industry 4.0 and Society 5.0.