AI4SE 2020

Second Workshop on the application of
Artificial Intelligence for Systems Engineering
Call for Presentations/Papers

http://www.kr.inf.uc3m.es/ai4se

INCOSE – AEIS - Carlos III University of Madrid

Madrid (Leganés), Spain, October 13-14, 2020

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The Knowledge Reuse Group, INCOSE and AEIS invite submissions to AI4SE workshop, which will take place at Carlos III University of Madrid within the "Artificial Intelligence in Systems Engineering Week".

Artificial Intelligence (AI), sometimes called machine intelligence, is intelligence "demonstrated" by machines, in contrast to the natural intelligence displayed by humans and animals. Computer science defines AI research as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chances of successfully achieving its goals. Colloquially, the term "artificial intelligence" is used to describe machines that mimic certain "cognitive" functions that humans associate with other human minds, such as "learning" and "problem solving".

Systems Engineering (SE) is an interdisciplinary field of engineering development and engineering management that focuses on how to design and manage complex systems throughout their life cycle. Activities such as requirements engineering, reliability management, logistics, coordination of different teams, testing and evaluation, maintainability and many other disciplines necessary for the successful development, design, implementation, and ultimate decommission of systems, become more difficult when dealing with large or complex projects.

----------------KEYNOTE SPEAKERS----------------

Lucio Tirone, INCOSE-EMEA.

(Obs, Keynote Speakers can be changed)

----------------TOPICS OF INTEREST----------------

Many of the challenges described in the previous definitions are human intensive, and could demand highly developed skills in learning, reasoning, decision making and problem solving. Therefore, Artificial Intelligence and all of its interleaved variants (machine learning, knowledge engineering, artificial reasoning, ontologies, optimization methods, etc.) are more and more relevant to systems engineering.

On the other hand, emergent Intelligent Systems like autonomous vehicles in all their facets (cars, trains, submarines, aircrafts, ships, etc.) are revolutionizing our perception of services. These systems are offering divergent ways of operations, where machines learn from their own operation and, theoretically, they improve its quality of service. Not deterministic systems propose giant challenges like how the certification should take place considering they will operate differently along its service life. How to V&V them, or even how to configure them in the case of potential accidents, ethical aspects etc.

Our purpose in this AI4SE workshop is to focus on the following application areas:

- AI for digitalization of Engineering
- AI for optimization of System of Interest (SOI) Operation and Maintenance
- AI for Technical and Organizational Management
- Systems Engineering for Intelligent Systems (non-deterministic)

The Artificial Intelligence for Systems Engineering Workshop, AI4SE is designed to be the meeting point for the industry and academia to share promising on-going or relevant past experiences where AI is applied to design and improve Systems Engineering processes, methods or tools, with a clear focus on practical applications. The organizing committee invites submissions of results from industrial projects, scientific works and demonstration activities on how models and technologies, from AI, cover the following (but not restricted to) topics:

04 — SE for Intelligent Systems

02 — AI for Optimization of SOI Operation

Intelligent Systems Engineering

AI for Technical and Organizational Management

AI for Digitalization of Engineering

03

01
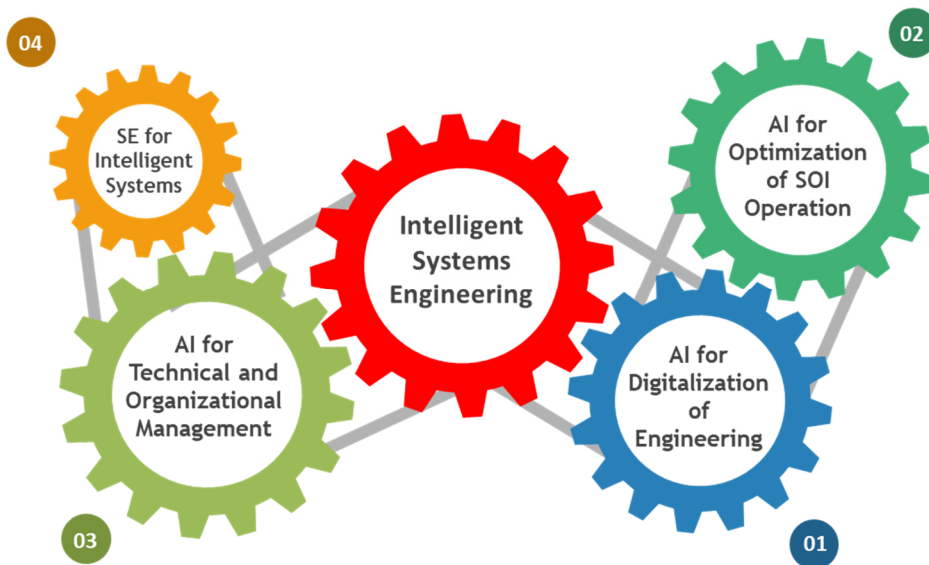
01. Digitalization of Engineering

- Smart Authoring
    - Computer assisted guidance for requirements development
    - Automatic generation of requirements, models, test cases, manuals
- Engineering Support Systems
    - Automatic Quality Judgement for requirements, models, components, the SOI, etc.
    - Automatic reasoning for trade-off analysis and decision management
    - Decision Support Systems for specification and modeling
    - Computer guided design methods (Designs Reuse)
    - Automatization of digital twin construction
    - Deep Learning for optimization and control
    - Smart safety analysis
- Engineering knowledge discovery
    - Automatic identification and/or suggestion of traceability links
    - Automatic patterns identification
    - Automatic generation of Product Lines from legacy information
    - Commonality/Variability discovery

O2. Optimization of SOI Operation and Maintenance

- Operational optimization

- • Optimization of System Governance

- Predictive maintenance of systems

- Smart configuration of the SOI

- • Self-organization of systems

- Human-machine smart interaction (virtual assistants, chat boxes, etc.)

O3. Technical and Organizational Management

- Decision Management Process

- Management Support Systems (Automatic Reasoning)

- Trade-off analysis

- Knowledge Management & Reuse

- • Relevant Knowledge discovery

- • Automatic generation of repositories

O4. Systems Engineering for Intelligent Systems

- V&V in Autonomous / Intelligent Systems

- Automatic V&V generation techniques

05. Ethics for Intelligent Systems

- Trustworthy autonomous systems

- Explainable decision systems

- Accountability analysis in intelligent decision systems

----------------SUBMISSION INFORMATION AND PAPER PUBLICATION----------------

Submissions will be accepted in two different formats, always written in English:

- • Regular papers (10-12 pages)
- • Presentation-only papers

Authors of accepted submissions will be notified and required to submit the final camera-ready version either as a Presentation-only or as a Regular paper.

Submissions for Regular papers must follow Springer LNCS format. Proceedings containing accepted papers will be published as a book with ISBN.

Presentation-only papers are format-free. Accepted Presentation-only papers will be allowed a slot for presentation at the Workshop and will be given the chance to be included in the Proceedings with a reformatting.

Submissions must be original and not published elsewhere. Each submission will be peer-reviewed by at least two members of the Program Committee. Acceptance will be based on the paper's significance, technical quality, clarity, relevance, and originality. All accepted papers must be orally presented at the workshop by one of the authors and at least one author of each accepted paper must register for the workshop.

All papers should be submitted in PDF format through the AI4SE EasyChair submission page https://easychair.org/conferences/?conf=ai4se2020.

----------------IMPORTANT DATES----------------

Submission deadline: June 1st, 2020

Notification of paper acceptance: July 31st, 2020

Camera ready papers deadline: August 31st, 2020

Workshop dates: October 13-14, 2020

----------------ORGANIZING COMMITTEE----------------

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