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An RE'21 Workshop on Environment-Driven Requirements Engineering (EnviRE'21)

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Abstract—We organize a one-day workshop on *Environment-Driven Requirements Engineering (EnviRE'21)* in conjunction with the 29th IEEE International Requirements Engineering Conference. With the rising influence of AI, IoT, and cyber-physical systems, we realize that the *environment*, in which the software operates, becomes more open and evolves rapidly with stakeholders' changing needs. EnviRE'21 features one keynote, four accepted papers, and one accepted presentation. Overall, the workshop is aimed at bringing the interested researchers and practitioners together, exchanging ideas and visions, and exploring a set of open problems to pursue in the years to come.

Index Terms—open environment, modeling, adaptation, learning, requirements monitoring, AI-based systems

I. INTRODUCTION

Welcome to EnviRE'21, a one-day workshop on “Environment-Driven Requirements Engineering” held in conjunction with the 29th IEEE International Requirements Engineering Conference. EnviRE is aimed at establishing a forum where researchers and practitioners can discuss the part of the real world (known as the “environment” according to Jackson [1]) in which the machine (i.e., software-intensive system) is installed and the machine's effect is observed and evaluated.

Modeling the environment will be more and more important in requirements engineering when the systems will situate in the open world and with the human in the loop. For example, IoT-enabled systems, autonomous unmanned systems [2], cyber-physical systems [3], AI-based systems [4], etc. are expected to be able to perceive the changes of an open and dynamic environment, respond to changes through architectural transformations, and exhibit context-aware, adaptive, and trustworthy behaviors [5].

We thank all the authors for submitting their papers that made this workshop possible, and all the members of the program committee who provided valuable feedback to the authors. We look forward to an exciting EnviRE'21 workshop!

II. ACCEPTED CONTRIBUTIONS

We are grateful for Shaukat Ali from Simula who will deliver a keynote at EnviRE'21, entitled “Application of Artificial Intelligence Techniques for Requirements Optimization, Learning, and Evolution for Cyber-Physical Systems”. His keynote will discuss the application of different AI techniques

in two directions: (i) the metaheuristic search-based methods for requirements prioritization, and (ii) machine learning-based methods for learning requirements and rules, including unknown relationships between cyber-physical systems and their environments from the data to enable systematic testing.

The program committee decided to accept the following papers:

- “Environment Model based Requirements Consistency Verification: An Example” by *Qianqian Liu, Xiaohong Chen, and Zhi Jin*
- “An Extended Meta-Model of Problem Frames to Support Reasoning about the Environment of Cyber-Physical Systems” by *Hongbin Xiao, Zhi Li, Yilong Yang, Jie Deng, and Shangfeng Wei*
- “The Role of Environmental Deviations in Engineering Robust Systems” by *Eunsuk Kang*
- “Specifying Autonomous Driving Scenarios” by *Yue Yu, Tiexin Wang, and Tao Yue*

In addition, the following presentation was accepted to EnviRE'21:

- “A Framework for Handling the Uncertainty of Environment Phenomena” by *Jingjing He, Liwei Zheng, and Zhanqi Cui*

III. PROGRAM COMMITTEE MEMBERS

- Tanmay Bhowmik, Mississippi State University, USA
- Xiaohong Chen, East China Normal University, China
- Xavier Franch, Universitat Politècnica de Catalunya, Spain
- Zhi Li, Guangxi Normal University, China
- Tao Yue, Nanjing University of Aeronautics and Astronautics, China

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