1st International Workshop on Model-driven Engineering and Large Language Models (ModLLM'24)

Hassan Sartaj[1], Shaukat Ali[1], Mehrdad Saadatmand[2], and Stefan Klikovits[3]

[1] Simula Research Laboratory, Oslo, Norway
{hassan,shaukat}@simula.no
[2] RISE Research Institutes of Sweden, Västerås, Sweden
mehrdad.saadatmand@ri.se
[3] Johannes Kepler University, Linz, Austria
stefan.klikovits@jku.at

Abstract. Model-driven Engineering (MDE) and Large Language Models (LLMs) represent two transformative forces in software engineering and artificial intelligence. MDE enhances software systems' productivity, quality, and maintainability by focusing on models as primary artifacts. On the other hand, LLMs, powered by machine learning algorithms, can understand and generate human-like text. Integrating LLMs into MDE can substantially improve tasks such as automating modeling, building modeling assistants, code generation from models, design automation, and verification. This synergy between MDE and LLMs could redefine the MDE process, making it more efficient and robust. This workshop aims to bring together researchers and industry professionals from diverse fields utilizing LLMs for different MDE tasks, promoting an environment of collaboration and knowledge exchange.

1 Motivation

1.1 Objectives

LLMs play a pivotal role in the realm of Artificial Intelligence (AI), especially in tasks related to Natural Language Processing (NLP). They help computers understand, interpret, and generate human language in a coherent and contextually relevant manner. LLMs are the driving force behind numerous applications, including machine translation, speech recognition, and text generation, enhancing the way humans interact with machines and making it more natural and intuitive.

While AI is a broad field encompassing all aspects of simulating human intelligence, LLMs focus specifically on language. AI includes components like machine learning, robotics, and computer vision, among others. In contrast, LLMs are specialized tools within the AI spectrum, primarily used to understand and generate human language. LLMs have recently gained significant attention in both the academic and industrial sectors. Their potential reaches far

beyond text generation, demonstrating impressive capabilities in various tasks, including code generation, testing, and model development. This workshop aims to unite researchers and industry practitioners from various domains utilizing LLMs in various MDE tasks, fostering a collaborative and knowledge-sharing environment.

1.2 Intended audience

ModLLM'24 workshop seeks to bring together a diverse group of researchers and practitioners interested in learning and sharing LLMs experiences for MDE activities. Moreover, this workshop strives to attract MDE students interested in expanding their expertise by learning LLM applications in model-driven software development.

1.3 Topics of interest

ModLLM'24 invites submissions on a wide range of topics, focusing mainly on LLMs and MDE. This includes, but is not limited to:

- LLMs for modeling emerging paradigms like Cyber-Physical Systems (CPSs), Internet of Things (IoT), Digital Twins, Blockchain Technology, Cloud Computing, and more.
- LLMs for model-driven software requirements engineering, software/system design, software design refactoring, and re-engineering
- LLMs for model-based testing, verification, and validation
- LLMs for executable and runtime models
- LLMs for model transformations
- LLMs for domain-specific modeling languages
- LLMs and MDE-related case studies and experience reports
- LLMs to build assistants in the MDE process, e.g., chatbots
- LLMs' role in MDE education

1.4 Relevance

Considering the significant role LLMs play in facilitating various MDE activities, it would be compelling for the MODELS community to delve into LLM-based MDE research, as well as its practical application in the industry.

1.5 Context

This marks the inaugural workshop dedicated to exploring the role of LLMs in MDE, organized by a diverse group of researchers from various backgrounds.

1.6 Need

The workshop would provide a platform for researchers and practitioners to share their findings, discuss new ideas, and explore potential collaborations. It would help in disseminating knowledge about the latest developments, methodologies, and best practices related to LLMs and MDE. Furthermore, such a workshop can help identify new research directions, challenges, and opportunities associated with the practical application of these technologies.

2 Organization

2.1 Details on the organizers

- **Hassan Sartaj** is a Postdoctoral Fellow at Simula Research Laboratory, Oslo, Norway. He is also a Professional Member of ACM and IEEE.
- **Shaukat Ali** is a Chief Research Scientist and Head of Department at Simula Research Laboratory, Oslo, Norway.
- **Mehrdad Saadatmand** is a Senior Researcher and research area leader of Software Engineering and Testing at RISE Research Institutes of Sweden, Västerås, Sweden.
- **Stefan Klikovits** is a University Assistant at Johannes Kepler University, Linz, Austria.

2.2 Workshop program committee

The expected program committee members are listed below.

- Marsha Chechik, University of Toronto, Canada
- Chouki Tibermacine, University of Montpellier, France
- Raluca Lefticaru, University of Bradford, UK
- Paolo Arcaini, National Institute of Informatics, Japan
- Klara Borowa, Warsaw University of Technology, Poland
- Patrizia Scandurra, University of Bergamo, Italy
- Henry Muccini, University of L'Aquila, Italy
- Nadeem Abbas, Linnaeus University, Sweden
- Muhammad Waseem, University of Jyväskylä, Finland
- Javier Troya, Universidad de Málaga, Spain
- Silvia Abrahão, Universitat Politècnica de València, Spain
- Thomas Kuehne, Victoria University of Wellington, New Zealand
- Muhammad Abbas, RISE Research Institutes of Sweden, Sweden
- Bedir Tekinerdogan, Wageningen University, Netherlands
- Man Zhang, Beihang University, China,
- Fitash Ul Haq, Luxembourg Institute of Science and Technology, Luxembourg
- Juha-Pekka Tolvanen, MetaCase, Finland
- Judith Michael, RWTH Aachen University, Germany
- Lola Burgueño, University of Malaga, Spain
- Jordi Cabot, Luxembourg Institute of Science and Technology, Luxembourg

2.3 Merge

We are open to merging the workshop if more workshops on similar topics are submitted.

3 Workshop format

3.1 Planned deadlines

- Paper submission: July 05, 2024 (AoE)
- Author notification: August 09, 2024 (AoE)
- Camera-ready deadline: August 14, 2024 (AoE)
- Workshop tentative date: September 24, 2024

3.2 Intended paper format

- **Full papers** are required to introduce novel approaches, research findings, or share experiences from industry/real-world practices in applying LLMs for MDE. The full paper's length **should not exceed 10 pages**, which includes all figures, tables, references, etc.
- **Short papers** are expected to present new ideas, approaches, emerging results, tools, and challenges of applying LLMs for various MDE tasks. The short paper's length **must not exceed 5 pages**, including all figures, tables, references, etc.

3.3 Evaluation process

Submissions will be assessed based on the following criteria.

1. **Novelty:** The degree of novelty presented in the contributed solutions, approaches, methodologies, and evaluations. The paper should demonstrate sufficient originality compared to the current state-of-the-art.
2. **Soundness:** The submission should demonstrate rigor, clarity, and technical depth in evaluation, case studies, and industry experience reports.
3. **Relevance:** The research's significance and potential influence on the field of MDE.
4. **Verifiability and Transparency:** The paper should provide adequate information to comprehend the innovation, data acquisition, analysis, and interpretation methods, thereby enabling an independent verification or replication of the contributions presented.
5. **Presentation:** The overall presentation quality of the submission.

3.4 Intended publication of accepted papers

We plan to organize online proceedings, which will be available at ACM Digital Library. Additionally, we intend to compile a Special Issue on LLMs and MDE for Software and Systems Modeling (SoSyM). Workshop participants will be encouraged to submit extended versions of their papers, with the best papers receiving an invitation to SoSyM's special issue.

3.5 Intended workshop format

- Duration: We expect a full-day event, which is subject to change based on the number of papers accepted.
- Number of presentations: ≈10 (including keynote)
- Planned keynotes: Lionel Briand, Marouane Kessentini, Alexander Egyed, Alfonso Pierantonio

3.6 Expected number of participants

Considering the rising popularity of LLMs, we anticipate approximately 50 participants.

3.7 Required equipment

The primary equipment requirements for this event include a projector, connector/multiport adapter, and pointer.

4 Additional material

- We are in the process of planning and constructing the workshop web page. It will be fully operational and accessible once the proposal receives approval.
- Draft call for workshop papers is attached at the end of the proposal.

ModLLM'24

1st International Workshop on Model-driven Engineering and Large Language Models (ModLLM'24)

Co-located with MODELS 2024, Linz, Austria *Sep 22 – 27, 2024*

https://www.ModLLM-workshop-website.com

Model-driven Engineering (MDE) and Large Language Models (LLMs) represent two transformative forces in software engineering and artificial intelligence. MDE enhances software systems' productivity, quality, and maintainability by focusing on models as primary artifacts. On the other hand, LLMs, powered by machine learning algorithms, can understand and generate human-like text. Integrating LLMs into MDE can substantially improve tasks such as automating modeling, building modeling assistants, code generation from models, design automation, and verification. This synergy between MDE and LLMs could redefine the MDE process, making it more efficient and robust.

Goal

LLMs have recently gained significant attention in both the academic and industrial sectors. Their potential reaches far beyond text generation, demonstrating impressive capabilities in various tasks, including code generation, testing, and model development. This workshop aims to unite researchers and industry practitioners from various domains utilizing LLMs in various MDE tasks, fostering a collaborative and knowledge-sharing environment.

ModLLM'24 workshop seeks to bring together a diverse group of researchers and practitioners interested in learning and sharing LLMs experiences for MDE activities.

Topics

ModLLM'24 invites submissions on a wide range of topics, focusing mainly on LLMs and MDE. This includes, but is not limited to:

- LLMs for modeling emerging paradigms like Cyber-Physical Systems (CPSs), Internet of Things (IoT), Digital Twins, Blockchain Technology, Cloud Computing, and more.
- LLMs for model-driven software requirements engineering, software/system design, software design refactoring, and re-engineering
- LLMs for model-based testing, verification, and validation
- LLMs for executable and runtime models
- LLMs for model transformations
- LLMs for domain-specific modeling languages
- LLMs and MDE-related case studies and experience reports
- LLMs to build assistants in the MDE process, e.g., chatbots
- LLMs' role in MDE education

Submissions

The following types of submissions are solicited:

- Regular papers (5–10 pages) detailing research contributions;
- Short papers (5 pages) presenting work-in-progress, vision, or position papers;
- Tool demonstration papers (5 pages), describing tooling aspects, practical insights, and tool demonstrations, potentially an appendix with a demo outline/screenshots and/or a short video/screencast illustrating the tool;
- Exemplar/dataset papers (5 pages), describing scenarios and datasets that can be used as benchmarks for future publications. They may optionally come with an appendix with further materials, or a short video/screencast illustrating the exemplar.

Submissions must adhere to the IEEE formatting instructions, which can be found at: IEEE - Manuscript Templates for Conference Proceedings, and must be submitted via EasyChair.

Important Dates

Deadline for submissions:
July 5, 2024

Notification of authors:
August 9, 2024

Organization Committee

Hassan Sartaj (Simula, NO)

Shaukat Ali (Simula, NO)

Mehrdad Saadatmand (RISE, SE)

Stefan Klikovits (JKU, AUT)

Program Committee

To be filled on acceptance