Language Understanding λ(μ) Laboratory

LU Talk

The Impact of Large Language Models on Machine Translation

Dr. Ohnmar Htun is an AI Research Scientist at Rakuten Institute of Technology-Singapore, Rakuten Inc., specializing in machine translation, computational linguistics, and large language model (LLM) development. With over a decade of experience in NLP, multilingual MT, and information retrieval, she has been working on large-scale multilingual translation systems, LLM fine-tuning, and document-level MT research at Rakuten Institute of Technology-Singapore in current. Previously, at Rakuten Institute of Technology-Tokyo, she worked on sentence encoding for ad recommendations, multilingual text classification, and AI-powered keyword extraction. She holds a Doctor of Engineering in Information Science and Control Engineering from Nagaoka University of Technology, Japan, and a Master's in E-Business Management from the International University of Japan. She has published extensively in WMT, WAT, SemEval, LREC, and IWSLT and actively contributes to shared tasks in machine translation and multilingual NLP research.

Abstract

The rapid advancement of Large Language Models (LLMs) has significantly transformed the landscape of Machine Translation (MT). This presentation explores the evolution of MT from rule-based and statistical models to the dominance of neural and transformer-based architectures. With the emergence of LLMs, translation systems have improved contextual understanding, scalability, and real-time adaptability, outperforming traditional approaches. Key discussions include the architectural innovations behind LLMs, their training methodologies, and their integration into multilingual translation pipelines. We examine the benefits of LLMs, such as enhanced accuracy, handling of ambiguous language, and cross-domain adaptability, alongside challenges like computational demands, bias, and low-resource language limitations. Real-world applications, including RakutenAI's fine-tuned LLMs for e-commerce and patent translation, illustrate practical implementations and industry impact. Finally, we explore future directions, emphasizing efficiency improvements, multimodal translation, bias reduction, and user-adaptive MT models. This study highlights the transformative potential of LLMs in reshaping global communication and the ongoing research to optimize their performance.

⏰ **10:00–11:00 AM (Bangkok Time), 11:00–12:00 PM (Singapore Time)**

📅 **March 15, 2025 (Saturday)**

💻 **Meeting ID: 895 2930 7583, Password: 495407**

Chairperson: Dr. Ye

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