Evolution of Generative AI: From techniques to applications

Generative AI refers to a suite of technologies capable of creating content in various forms, including images, videos, text, etc. Recent breakthroughs in models such as DALL-E and ChatGPT have garnered widespread attention due to their versatility in generating content in the form of images and text respectively for diverse textual queries. These innovations have given rise to numerous applications, and researchers continue to explore new possibilities. At the core of generative AI lies the transformer architecture and large language models (LLMs), which have millions to trillions of parameters and require training on vast datasets. This process is complex and involves multi-step training methods, including language modeling, instruction fine-tuning, and Reinforcement Learning with Human Feedback (RLHF) to name a few. Our presentation will delve into these elements and examine the evolving landscape of generative AI, highlighting recent advancements within our group and how we leverage these technologies for our applications.