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Title: Simplifying Formal Proof Generation: A Journey with ChatGPT and Basic Search Techniques

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Abstract: Formal proof generation has a long and rich history, yet recent advances in machine learning suggest that we may finally be at the stage of making real progress for practical mathematical problems. In this talk, I will share experiences from our collaborative work integrating a large language model, ChatGPT, with basic search techniques to streamline the generation of formal proofs in Lean. This proof assistant ensures rigorous correctness through verifiability. By combining the representational power of ChatGPT with Lean's robust framework, we improve both the efficiency and accessibility of formal proof creation. Despite its relative simplicity, our best-performing model achieves a 31.15% pass rate on the miniF2F benchmark dataset. This presentation builds on joint work with Sangjun Han, Taeil Hur, Kathy Sangkyung Lee, Myungyoon Lee, and Hyojae Lim.