TITLE: Exploring a Path Toward AGI via Domain-Specific Languages and Logic Programming

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ABSTRACT: Recent advances in artificial intelligence have been driven largely by large language models based on the Transformer architecture. Despite their impressive performance, many researchers argue that further scaling alone is unlikely to produce Artificial General Intelligence (AGI), citing fundamental limitations in reasoning, abstraction, and adaptability. In particular, current systems often struggle with novel tasks that require learning new rules from minimal data.

The ARC-AGI (Abstraction and Reasoning Corpus) benchmark was designed to expose precisely these limitations. Rather than testing memorized knowledge, ARC-AGI focuses on few-shot learning and abstract reasoning: inferring a latent rule from a handful of examples and applying it to a new situation. This remains an open challenge for modern AI systems.

In this talk, I explore an alternative, logic-based approach to such problems using domain-specific languages and logic programming. Drawing on ideas from lambda calculus, type theory, and the Hindleyâ€“Milner type system, I describe how symbolic representations and typed program synthesis can be used to model abstraction and reasoning in a more structured way. Prolog serves as a concrete implementation platform, reflecting its original goal of treating logical inference as computation.

The goal of the talk is not to present a complete solution to AGI, but to illustrate how classical ideas from mathematical logic and programming language theory can shed light on the kinds of reasoning required by benchmarks such as ARC-AGI, and why these ideas may complement data-driven approaches.