

Preface

Artificial intelligence consists of many smaller communities with diverse approaches towards the common goal of creating computational intelligence. While they are unified by this common goal, and most take inspiration from human or biological intelligence, these separate communities are driven by different abstractions of intelligence (such as symbolic manipulation, connectionist networks, or embodiment) and the processes that might produce it (such as reinforcement learning, evolutionary computation, or statistical machine learning). Because the particular choice of abstraction profoundly impacts how a problem is framed, reaching the ambitious goals of AI may require carefully examining the promise, drawbacks, and motivations of popular abstractions.

Subfields of artificial intelligence often diversify from a core idea. For example, deep learning networks, models in computational neuroscience, and neuroevolution all take inspiration from biological neural networks as a potential pathway to AI. Most researchers choose to pursue the subfield (and by extension, abstraction) they see as most promising for leading to AI, which naturally results in significant debate and disagreement among researchers as to what abstraction is best. A better understanding and less polarized debate may result from a clear presentation and discussion of abstractions by their most knowledgeable proponents.

These insights motivated bringing together researchers from fields that abstract AI at different levels or in different ways to disperse knowledge, and to critically examining the value and promise of different abstractions. Thus this AAAI symposium, *How Intelligence Should be Abstracted in AI*, consisted of a diverse and multidisciplinary group of AI researchers interested in discussing and comparing different abstractions of both intelligence and processes that might create it. By providing a common ground for these diverse perspectives, the result was a cross-pollination of ideas between levels and types of abstraction, and new ideas for revising and creating abstractions of intelligence and intelligence-generating processes.

The papers in the proceedings that follow critically examine biological intelligence and its relation to AI from a diversity of viewpoints. We hope that as you examine this cross-section of the varying perspectives within AI, that these proceedings will challenge your preconceptions about what research trajectory is most promising for creating intelligent algorithms.

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