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Bridging the Implementation Gap: From Sensorimotor Experience to Abstract Conceptual Knowledge

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Abstract: We develop a sensorimotor perspective on conceptual knowledge, paying particular attention to the imperatives of an artificial system. Motivated by the gap between low-level sensorimotor experience and human-level conceptual knowledge, we contrast experiential knowledge with the classical notion of concepts. We discuss three ways in which experience and classical concepts differ: experience is dynamic rather than static, subjective rather than objective, and composed of minutiae rather than compact abstractions. We present a mechanism for abstracting from experience and show how it might recover some of the benefits of concepts while addressing some of the difficulties of classical theory. Finally, we implement a simple example which illustrates first steps towards bridging the gap between sensorimotor experience and high-level concepts.