While several machine vision systems today can each successfully perform one or a few human tasks – such as detecting human faces in point-and-shoot cameras – they are still limited in their ability to perform a wide range of visual tasks, to operate in complex, cluttered environments, and to provide reasoning for their decisions. In contrast, the mammalian visual cortex excels in a broad variety of goal-oriented cognitive tasks, and is at least three orders of magnitude more energy efficient than customized state-of-the-art machine vision systems. This talk will highlight ongoing working towards designing a holistic machine vision system that will approach the cognitive abilities of the human cortex, by developing a comprehensive solution consisting of vision algorithms, hardware design, human-machine interfaces, and information storage.