

Computational theories and their implementation in the brain : the legacy of David Marr

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Abstrak

In the late 1960s and early 1970s David Marr produced three astonishing papers in which he gave a detailed account of how the fine structure and known cell types of the cerebellum, hippocampus and neocortex perform the functions that they do. He later went on to be one of the main founders of Computational Neuroscience. In his book on Vision he distinguished between the computational, algorithmic and implementational levels, and the three early theories concerned implementation. However, they were produced when Neuroscience was in its infancy. Now that so much more is known it is time to revisit these early theories to see to what extent they are still valid and what needs to be altered to produce viable theories that stand up to current evidence. This book has gathered some of the most distinguished international contributors to do this. After a general introduction there are three chapters on the cerebellum, three on the hippocampus and two on the neocortex. The book ends with an appreciation of the life of David Marr by Lucia Vaina.