

From materials to maths: the necessity and nature of a formal foundation for neuromorphic computing

Herbert Jaeger

Rijksuniversiteit Groningen (RUG), Bernoulliborg, Nijenborgh 9
9747 AG Groningen, The Netherlands

h.jaeger@rug.nl

Abstract: In this talk I want to alert materials scientists and device physicists to the painful absence of a unifying formal theory for neuromorphic computing (NC). Starting from rehearsing the conditions that make digital computing (DC) so immensely powerful, I outline in what ways NC is fundamentally different from DC, and which structural elements from the theory of DC must be recovered in new ways to help NC climb toward the usefulness levels of DC, ... and why this is not going to be mathematically easy.