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**“Hard Intangibles”**

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**Introduced by**

Professor Jonathan Aronson  
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**Synopsis**

We are filling our world with complex intangibles like electronic markets, digital social networks, and rich software programs. Since there are significant limitations in our ability to understand these artifacts, this is leading to a growing gap between our innate cognitive capacities and the world we're building.

I outline the “Hard Intangibles” research program which aims to understand the interaction between human cognition and complex abstractions, and thus to find ways to improve our thinking and decision-making. I discuss the results of a conceptual analysis of wireless communications which show how

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research and policymaking are shaped by a system of metaphors; discuss work-in-progress on how the differences between digital systems and the physical world confound our built-in expectations; and outline possible ways to answer the question, "Why is Programming Hard?"

### **Biography**

Pierre de Vries is working to understand how our innate models of reality limit our ability to make good judgments about complex abstractions. He is mapping the mental models that software developers have of their work. These models are often concrete metaphors that may not represent the complexity of software very well, leading to errors and misjudgments. Software is being used as a proxy for a raft of abstractions in many areas of the knowledge economy, like complex dynamic systems, financial markets, and bodies of law.

De Vries is a former Chief of Incubation, and former Senior Director of Advanced Technology and Policy at Microsoft Corporation. Prior to Microsoft, de Vries worked for Korda & Co., a London-based seed capital company and consultancy, advising corporate customers like Pearson and Scientific Atlanta on the likely evolution and business impact of new technologies such as satellite television and electronic publishing. He evaluated potential venture capital investments, negotiated investments and relationships, and served as a board member.

He earned a B.Sc. (Honours) (cum laude) in theoretical physics from Stellenbosch University in 1983, and a Ph.D. in theoretical physics from Oxford in 1987.