

This presentation analyses the essence of DataFlow SuperComputing, defines its advantages and sheds light on the related programming model. DataFlow computers, compared to ControlFlow computers, offer speedups of 20 to 200 (even 2000 for some applications), power reductions of about 20, and size reductions of also about 20. However, the programming paradigm is different, and has to be mastered. The talk explains the paradigm, using Maxeler as an example, and sheds light on the ongoing research in the field. Examples include DataEngineering, DataMining, FinancialAnalytics, etc. A recent study from Tsinghua University in China reveals that, for Shallow Water Weather Forecast, which is a BigData problem, on the 1U level, the Maxeler DataFlow machine is 14 times faster than the Tianhe machine, which is rated #1 on the Top 500 list (based on Linpack, which is a small data benchmark). Given enough time, the talk also gives a tutorial about the programming in space, which is the programming paradigm used for the Maxeler dataflow machines (established in 2014 by Stanford, Imperial, Tsinghua, and the University of Tokyo).