

The Concurrent Constraint Programming Research Programmes – Redux

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Abstract. Twenty years ago, in 1995, I was honored to be one of the first invited speakers at PPCP. Much has changed in the computational world since then: we have seen the penetration of the Internet in every aspect of human life; the establishment of the multi-core era; the arrival of the petaflop era in high performance computing; the rise of big data, analytics and machine learning; and the emergence of the cloud (the planet-wide computer) as the new infrastructure. With this backdrop, we review the many developments in CCP over the last twenty years, and revisit the core idea behind this framework: the use of constraints for communication and control in concurrent programming languages. We propose C10: a pure CCP framework realized by compilation to the high performance concurrent programming language, X10, and illustrate multiple anticipated uses in the area of probabilistic programming, machine learning, and big data analytics.