

The Youtopia Project on Declarative Data-driven Coordination

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As the world becomes more interdependent and computing grows more collaborative, there is a need for new abstractions and tools to help users work together. This has become even truer with the advent of crowd sourcing. In this talk, I present an overview of the status and contributions of the Youtopia project, a collaboration of researchers at Cornell University and at EPFL. We have introduced entangled queries as a mechanism for information exchange between database queries. The next step was to introduce entangled transactions, units of work similar to traditional transactions that however do not run in isolation, but communicate with each other via entangled queries. Supporting entangled transactions brings about many new challenges, from an abstract model to an investigation of the unique systems issues that arise during their implementation. We first introduce a novel semantic model for entangled transactions that comes with analogues of the classical ACID properties. We then discuss execution models for entangled transactions and select a concrete design motivated by application scenarios. With a prototype system that implements this design, we show experimental results that demonstrate the viability of entangled transactions in real-world application settings.