

Fraglets: Stochastic Programming for Provable Program Dynamics and Self-Healing Programs

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In Fraglets - a chemically inspired programming language - we are able to predict and even prove the dynamic behavior of programs, despite the stochastic execution of its code. In addition to traditional symbolic computation, we exploit this execution dynamics to perform implicit computations on a macroscopic level, where information is represented by the multiplicity of entities and the rate of their production. This allows us to maintain a stable population of redundant code parts that replicate themselves, yielding intrinsic self-healing code, which is robust to the deletion of its individual parts.