A biological-like synthesis framework for software engineering environments

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This research proposes a Biological-like Architecture for Software Systems (BASS) that make up of software components. The design principle is to mimic the simplicity of uni-cellular life form as fixed-sized blocks linearly arranged as a flat array so that all references to those components can be reached directly. Each component holds its attributes and operations to permit self-execution without external support. Like living cells, this autonomy is modeled to be short-lived that undergoes a three-stage life cycle, namely, *creation*, *sustainment*, and *cessation*. This cycle must run to completion within a predefined Time-To-Live (TTL) limit. When the time limit of an existing component expires, a new component is created to replace *in situ* to conserve system energy and overhead. A simulation is conducted to test the operating characteristics of this three-stage life cycle under the time limit. The results reveal that component replacement *in situ* is practically viable. It is envisioned that BASS will offer an energy-efficient environment that can alleviate software systems resource utilization considerably.