Rust For Semanticists

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Rust is a low-level systems programming language from Mozilla, which is being used to develop the Servo next generation browsing engine. In 2016 it was voted "Most Loved Technology" in the Stack Overflow Developers' Survey. It focuses on finding a balance between performance and safety, by using techniques from the programming languages research community: affine types and region analysis. Rust uses affine types to track aliasing: each object either has many readers, or a single writer, never both, and so avoids many problems associated with simultaneous write access such as concurrent data races and iterator invalidation. Rust does not have automatic memory management, and instead uses region analysis to ensure that there are no use-after-free errors. These features have been in the programming languages research community since the late 20th century, but Rust is the first widely-adopted systems programming language to take advantage of them. In this talk, I will present Rust for an audience familiar with programming language semantics, and discuss the experience of using affine types and region analysis as part of a large systems programming effort.