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Talk: On the Expressive Power of Programming Languages by Shriram Krishnamurthi [PWLConf 2019]

Summary of Talk:
The paper spoken about in the talk expresses how there are differences between classes of language features. Basically, these distinctions offer advice to those who design programming languages, but at a certain point we reach the "Turing Threshold" where everything becomes equal. It was stated that we can utilize mathematics to draw mathematical distinctions between things that we might have intuitive thoughts about.

Fundamentally, the definition of equality in itself is difficult. The definition of equality was not just defined as a single equals sign. Equality in this scenario was more about observational equivalence where in every context two expressions remain equal. Additionally, observational equality is inquiring whether there is a way inside the language two tell two expressions apart. Thus, the more observations you can perform on expressions the fewer things are equal as more differences can be discovered. Expressiveness was a large part of the seminar, where distinguishing whether adding new features is beneficial to the programming language being generated. Expressiveness can be exhibited when an added feature changes the equality of an expression, hence, power is added to the language. Furthermore, if a new feature is added to a language and the previously equivalent expressions remains intact, then we can deduce that F has no added power in the language.

One of the main points of the paper is that transformations have to be global not purely local, which is one of the consequences of the paper. Moreover, these global transformations are used to add expressive power to a language.

Overall, this paper has shown that distinctions can be made between language features inside the space of Turing Completeness through mathematical truth rather than just through beliefs.