

CS4012

Topics in Functional Programming

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Topics?

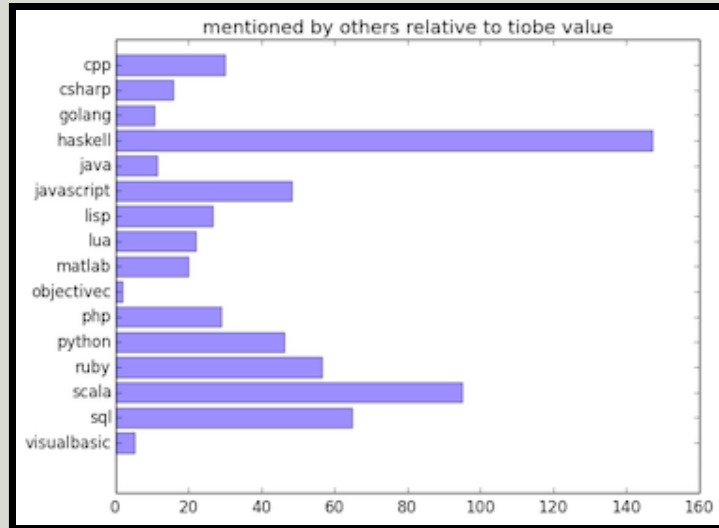
It's about *using* Haskell (and other languages) to explore advanced topics from research and industry

The ideas that have emerged from the functional programming community in the last 10-15 years

Where did the designers of Scala, F#, Java 8, etc. get their ideas?

Functional Programming?

Functional programming



graph by Tobias Hermann

What will we do?

Lectures on advanced topics

Readings from research papers in the field

Projects applying these ideas, building better functional programs

Focus is on Haskell, but we will mention a little about Scala, Clojure, F#, Agda, Idris

What kind of topics?

Embedded Domain Specific Languages

Monadic programming

Parallel and Concurrent functional programming (including Software Transactional Memory, Map/Reduce, and other topics)

Advanced type system features (e.g. existential types, dependent types)

Lenses ("jQuery for data types")

Pipes and Conduits

Most importantly: How to use all this in program design

Why do this?

You want...

to be a better programmer (whatever language you end up using)

to explore things that won't be making it to textbooks for a few years yet

a chance to examine and critique recent (and classic) research papers