

Project

Most of the topics listed are from our main reference on JavaScript during this course, namely *Eloquent JavaScript: A Modern Introduction to Programming* from Marijn Haverbeke.

The last two projects listed are, actually, general topics rather than specific projects. Like open problems, you'd need to dive in a bit more, define your idea of a project and see it through. I would help all the steps along the way, of course.

The last topic on Linguistics with Haskell is way more technical. I would provide you with notes. Nevertheless, there is a reference I'd be using as a guide, which is *Computational Semantics with Functional Programming*, from Jan van Eijck and Christina Unger. It would serve two purposes at the same time, namely, introducing you to one of the coolest functional languages out there nowadays, Haskell, and exploring ideas on Linguistics and Logic and have a glance on how all that may lead to quite advanced mathematical methods.

Along the way we will learn about things like regular expressions, parsin or finite automata, besides some elementary topics in linguistics. From the point of view of Haskell, we will about its powerful implementation of abstract data types, its lazy evaluation or its use of pattern-matching definitions.

Some pointers on Haskell are the Haskell wiki.

Alternatively, this topic may be address through Python with the NLTK module. This has a more applied emphasis. The reference is *Natural Language Processing with Python* by Steven Bird et al. You can find an online version here

Finally, the last topic on Deep Learning, is an invitation to further explore the topic of neural networks and build one with the use of standard software, either with Google's Tensor Flow or Python's SciKit-Learn library (or alternatively, Anaconda). Simple ideas that are feasible to explore in the time we have are, e.g., character recognition or image classification.

References

Besides the notes and explanation I will provide you, googling for a topic might give you some pointer.

I also urge you to check out the Library Genesis. There you will find **all textbooks for free in electronic form**. It's use though is not exempt of

criticisms and potential problems. While their server is likely illegal in most countries, its ethical status is far from being clear cut: Can learning on your own the fundamentals of human knowledge be reprovable, specially in the digital age? Can accessing such information be reprovable? Should it be left only to the few wealthy or lucky enough? For more details, search for it in Google or visit the Wikipedia article on it