Abstract

The verification of common used data structures and algorithms are already well completed. But the verified graph algorithms seems to be less mentioned. Although implementing graph and the related algorithms is easy while side effects are allowed, it is not that trivial to have them down in a purely functional style.

To explore this subject, we will firstly refer to John Launchbury's paper and the open source functional graph libraries. Then, we will construct our graph with stainless and verify the Dijkstra's Algorithm with stainless in this project. If time allows, we will try to optimize its complexity with verified priority queue in addition.

Reference

Launchbury, J. (1995, May). Graph algorithms with a functional flavour. In *International School on Advanced Functional Programming* (pp. 308-331). Springer, Berlin, Heidelberg.