Vincent Liu, Ayush Khanal, Brian Nguyen, Matthew Strong

Joshua A. Grochow, Ryan Layer

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Annotated Bibliography

Grochow, Joshua A, and Manolis Kellis. "Network Motif Discovery Using Subgraph Enumeration and Symmetry-Breaking." *Joshua A. Grochow*, Springer-Verlag Berlin Heidelberg , 2007, www.cs.colorado.edu/~jgrochow/Grochow_Kellis_RECOMB_07_Network_Motifs.pdf.

Joshua A. Grochow wrote this while a student at the Unversity of Chicago; he is now an assistant professor at the University of Colorado Boulder in the Departments of Computer Science and Mathematics.

Grochow and Kellis propose an algorithm that will find larger network sub-structures and discover network motifs: a symmetry breaking technique which eliminates repeated and therefore unnecessary isomorphism testing, which rapidly speeds up performance compared to other algorithms. We based our code off of this algorithm because it is well-known, intuitive, and has proven to work well. It was convenient as well to refer to this paper because it is the original algorithm, and understanding this paper allowed us to approach other literature more comfortably.

Kim, Wooyung, et al. " NemoMap: Improved Motif-Centric Network Motif Discovery Algorithm." *Astes Journal*, ASTES, 29 Sept. 2018, www.astesj.com/publications/ASTESJ_030523.pdf.

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Kim and the other two authors propose a new algorithm that they cite as a direct improvement over Grochow/Kellis' motif-centric algorithm. This paper solidified the concepts of network motif algorithms and especially GK algorithm because NemoMap is heavily inspired by GK algorithm. Reading this paper was exceptionally useful for deeply understanding the performance of GK algorithm.

Kingsford, Carl. "Network Motifs: Simple Building Blocks of Complex Networks." Carnegie Mellon University Bioinformatics Lectures. Network Motifs, Pittsburgh, Carnegie Mellon University, www.cs.cmu.edu/~ckingsf/bioinfo-lectures/.

Cites Grochow and Kellis algorithm.

Although adapted for a lecture and a greatly reduced explanation of the original GK algorithm, Kingsford's slides provide a high level overview of the GK algorithm. However, the use of visual aids in explaining this algorithm was the eventual catalyst that led to being able to write the GK algorithm. These lectures were extremely concise and provided a very approachable starting point for coding the GK algorithm from scratch.