Icelandic Research Fund

External Peer Review

RANNIS reference:	141761-051
Principal investigator:	Henning Arnór Úlfarsson
Organisation:	Reykjavik University-School of Computer science
Project title:	Finding structure in sets of permutations
Expert Panel:	Engineering, technical sciences and sciences
Fund:	Project grant
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Part 1 - In depth

Originality of the project

Grade: 4 of 5

The main focus of this proposal is to develop state of the art computer software system which will aid researchers in permutation patterns to be able to start with a set of permutations X and to discover whether X is the set of permutations that avoid a certain set of patterns and possibly to find generating functions or recursions to enumerate X. The study of patterns in permutations and words is a very active area of research. There are many examples of software packages that have been written by individual researchers to solve specific problems, but this proposal is attempt to build a start of art system by three of the leading researchers in the field.

State of the art

Grade: 5 of 5

The PIs all have experience writing software packages to study various problems in permutation patterns that have been successfully used by other researchers. No one has attempted to write a general purpose package like the one that is proposed.

Principal investigator and project management

Grade: 5 of 5

The PI is a very promising young researcher in permutation patterns. He is best known for his work on characterizing certain classes of Schubert varieties which are indexed by permutations by the patterns that the permutations avoid.

The Co-PIs, Mike Albert and Anders Claesson are both leading researchers in the study of permutation patterns. All three have successful written software packages to help researchers in the study of permutation patterns that have been used successfully by other researchers in the field. Thus PI and CoPIs are fully capable of making significant progress of the proposed research and deliverables.

Deliverables and impact

Grade: 5 of 5

I think that the software package proposed by the PI and the Co-PIs would be one that we be widely used by researchers in the field of permutation patterns and should lead to new discovers.

Part 2 - Summary

Overall strengths

The strength of the proposal is to develop a new software system that would bring together many different algorithms that have been used by researchers in the past in the study of permutations patterns as well as to extend such algorithms and develop new algorithms to handle wider classes of permutation patterns.

Overall weaknesses

The weakness of the proposal is that I would have liked to see more details on the specific problems that PI and Co-PIs plan to attack with their software. I can think of a large number of such problems for which the software might be relevant, but it would have been helpful to have the proposal give details about some of the key problems that they would like to attack.

Overall score

Grade: 19 of 20