

Advisor's Review of "Life-like simple particle motion", a bachelor thesis by Hyungbin Joo

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Summary

This work describes an independent implementation and reproduction of a very interesting result by Schmickl et. al where a simple rule is described governing motion of particles which results in a very life-like system to emerge. The original study was published in Nature and is very though provoking. As such, independent reproduction of the results are of great value. Thus, even if the present work does not produce any new scientific results, as a bachelor thesis it is an excellent work.

The original goal of the thesis was to reproduce the results described by Schmickl et. al and then possibly formulate an underlying phenomenon that explains the behaviour of the system. The author of the thesis – Hyungbin Joo – has managed to complete the former task very well but no progress was made on the latter aspect. This, however, should not be very surprising due to two reasons: firstly, it is a bachelor thesis and the latter goal is perhaps too ambitious for this level. Secondly, the past year has created very difficult circumstances for students due to the COVID pandemic and they had to essentially be their own guide and teacher to a large degree (despite online help which must have been only limited in effect.)

The thesis is very well structured and written in a sophisticated linguistic style. Experiments are substantially thorough considering the time constraints of the student. I would like to remark that Hyungbin showed initiative and self-sufficiency in understanding the material and working on the implementation to a very high degree.

Evaluation

Strengths

- The work is structured and presented in a coherent fashion and the author demonstrates a clear knack for explaining things well.
- The work is non-trivial (for the standards of a bachelor thesis). Hyungbin had to come up with many ideas relating to data and feature

extraction from the implementation. Some things were not very precisely described in the original study (such as how exactly to count the number of cells) and Hyungbin had to come up with ways to do it essentially on his own. I consider my guidance in this regard quite minimal.

Weaknesses

I do not see any significant weaknesses in the thesis.

Conclusion

The author of thesis has aptly demonstrated the capability to understand technical ideas and present them well. I recommend that this thesis be accepted as a bachelor thesis with the grade “2”.

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