

# Propositions

accompanying the thesis

## Theory and Applications of Differential Equation Methods for Graph-based Learning

by

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1. A great proof makes a theorem obvious—but great theorems don't necessarily have great proofs.
2. Mathematical induction is for results which are worth proving but are not worth proving well.
3. Trivial linear algebra can lead to non-trivial breakthroughs. (Pertains to chapter 6.)
4. Allen–Cahn flow and the Merriman–Bence–Osher (MBO) scheme on graphs are linked via our SDIE scheme. Our new definition of graph mean curvature flow resembles the graph MBO scheme. (Pertains to chapters 4 and 7.)
5. “Define as many interesting objects as we can on a graph” is a legitimate research program.
6. Don't ignore machine learning, no area of applied mathematics will be left untouched by it (paraphrasing Stan Osher's advice to me at ICISP 2018).
7. Research is not value-free—ethics always plays a role.
8. You always learn something from a computation.
9. French conferences have the best food.
10.  $e^x \geq 1 + x$  is unreasonably useful for a trivial inequality.

These propositions are regarded as opposable and defensible, and have been approved as such by the promotor Dr. J.L.A. Dubbeldam.