

Thesis Changes Log

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PhD Program: Computational and Data Science and Engineering

Title of Thesis: Combinatorial and Neural Graph Vector Representations

Supervisor: Prof. Evgeny Burnaev

The thesis document includes the following changes in answer to the external review process.

Dear Reviewers,

I would like to thank you for the useful comments which were invaluable in improving the thesis. I also consider all the comments in my future research. Below please find the responses.

Yours sincerely,
Sergey Ivanov

Main changes:

- Fixed many grammatical errors, misspellings, article corrections.
- All feedback of reviewers was taken into account. Now the thesis is corrected with many minor inaccuracies in equations, claims, and theorems.
- Added part on solving influence maximization with Harvester.

Changes Log:

Matthew Blaschko:

1. Added citation for $(1-1/e)$ approximation for influence maximization (submodular literature)
2. Corrected p.10 1st paragraph - Euler circuit / path, qualify that result is for connected graphs, Euler path exists if Euler circuit exists, so second iff isn't complete.
3. Corrected (1.2) Q is a binary matrix with entries in $\{0,1\}$. QQ^T cannot have negative entries, but ΔA can.
4. Removed p.24-25 7 item list seems a bit redundant
5. Fixed (2.4) notation for a single graph used in place of a set of graphs.
6. Fixed (2.5) imbalanced parentheses - this does not seem to denote accuracy in standard notation. Assuming $[]$ is Iverson bracket notation.
7. Fixed (2.6) implication is actually in the other direction.
8. Fixed (2.9) $q \times A \times p$ needs to depend on k .
9. Removed 2.9 as it is duplicate of 2.8.
10. Explained more clearly Prop. 2.2: $O(n^2t)$ means that the uncertainty remains in $O(t)$, and this presumably is what the comments after Thm. 2.13 are about: that $O(t)$ is where the NP-hardness is hiding.
11. Fixed Table 2.2 & 2.3 with better acronyms and highlights
12. Added p.77 CAIM acronym introduced without saying what it stands for.

Maxim Panov:

1. Added plenty of references to major concepts in the Section 1.1 and 2.1.
2. Reformulated goals in Section 1.1.1 to be more precise and focused on solving certain problems.
3. Corrected the list of publications in section 1.1.1.
4. Made a smooth transition to topological descriptors in page 33.
5. Replaced usage of equation in text with `\eqref`
6. Edited less formal statement about theorems (for example for theorem 2.13)
7. Renamed the object in formula 2.21 to variational lower bound.

Andrzej Cichocki

1. Added a paragraph describing possible future directions regarding end-to-end method for RL framework that operates on combinatorial problems