University of Glasgow | School of Computing Science

Counting Monochromatic Components in Adversarial Graph Burning

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ABSTRACT

According to Simon Peyton Jones, an abstract should address four key questions. First, what is the problem that this paper tackles? Second, why is this an interesting problem? Third, what is the solution this paper proposes? Finally, why is the proposed solution a good one?

1. INTRODUCTION

This paper outlines the standard template for an MSci submission. In earlier years, MSci students at the School of Computing Science[1], University of Glasgow, were expected to produce a full-length dissertation. Now, the requirement is for MSci students to write a paper of up to 14 pages in length, using the supplied `mpaper` LaTeXstyle file.

The precise structure of an MSci paper is not mandated, but it should probably cover in detail the following aspects of the project.

1. General description of the problem, motivation, relevance
2. Background information, possibly including a literature survey
3. Description of approach taken to solve the problem, including high-level design and lower-level implementation details as appropriate
4. Evaluation, qualitative or quantitative as appropriate
5. Conclusion, including scope for future work

2. BACKGROUND

This LaTeXtemplate is based on the ACM `sig-alternate` class. The layout is two-column text. Generally figures and tables only extend to one column width, e.g. Table 1, but it is possible to make them stretch over both columns using the `figure*` and `table*` environments. For an example, see Figure 1.

3. THE WIZWOZ SYSTEM

Again, Simon Peyton Jones has a lovely description of how to write a paper on his website[2]. Personally, I put URLs in footnotes and *bona fide* references in the bibliography. For instance, Turing [2] and Knuth [1] would not be out of place in list of references. How many references? Hard to say. Five is not enough, 50 is pushing it.

[1] `http://www.dcs.gla.ac.uk`

[2] `http://research.microsoft.com/en-us/um/people/simonpj/papers/giving-a-talk/giving-a-talk.htm`

Operating System	*Version*	*Verdict*
Ubuntu	12.04	Everyone's favourite Linux, unless you grew up with RedHat
Slackware	xxx	Pseudo-hacker's Linux, how often do you recompile your kernel?
Mac OS	10.7	For people with more money than sense

Table 1: Single column table of figures

4. ADVERSARIAL GRAPH BURNING

4.1 Defining Adversarial Graph Burning

First, we formalise the process of Adversarial Graph Burning on a graph G. Throughout, we presume that G is a finite, simple, undirected graph.

DEFINITION 4.1. *Adversarial Graph Burning (or AGB for short) is a discrete-time graph process for two players (and by convention, player 1 and 2 are red and blue, respectively). Each vertex is assigned one of 4 colours:*

1. White *vertices have not been burned by either player yet.*
2. Red *vertices have been burned by player 1.*
3. Blue *vertices have been burned by player 2.*
4. Green *vertices have been burned by* both *players.*

At time $t = 0$, all vertices are white. At each time $t > 0$, each player simultaneously chooses one white vertex to burn.

4.2 Burning Sequences

4.3 Bounding the length of burning sequences

5. COUNTING MONOCHROMATIC COMPONENTS

Figure 1: An example figure stretching over two columns

5.1 Monochromatic components on paths

5.2 Caterpillar graphs

5.3 Monochromatic components on caterpillar graphs

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6. REFERENCES

[1] D. E. Knuth. *The Art of Computer Programming, Volume 1: Fundamental Algorithms*. Addison Wesley, 1st edition, 1968.

[2] A. M. Turing. On computable numbers, with an application to the entscheidungsproblem. *Proceedings of the London Mathematical Society Series 2*, 42:230–265, 1937.