

CHENNAI MATHEMATICAL INSTITUTE

MASTERS THESIS

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# Random Spanning Trees

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*Author:*

Bhishmaraj S

*Supervisor:*

Dr. Samir DATTA

*A thesis submitted in fulfillment of the requirements  
for the degree of Master of Science*

*in the*

Computer Science at CMI

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## Declaration of Authorship

I, Bhishmaraj S, declare that this thesis titled, “Random Spanning Trees” and the work presented in it are my own. I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University.
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- Where I have consulted the published work of others, this is always clearly attributed.
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- I have acknowledged all main sources of help.
- Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself .

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# *Abstract*

Faculty Name  
Computer Science at CMI

Master of Science

**Random Spanning Trees**

by Bhishmaraj S

The Thesis Abstract is written here (and usually kept to just this page). The page is kept centered vertically so can expand into the blank space above the title too....  
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## *Acknowledgements*

The acknowledgments and the people to thank go here, don't forget to include your project advisor. . .





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# List of Abbreviations

**LAH** List Abbreviations Here  
**WSF** What (it) Stands For





# 1 Introduction



## 2 Background

### 2.1 Markov Chains

#### 2.1.1 Fundamental theorem of Markov chain

#### 2.1.2 Markov chain tree theorem

### 2.2 Results from Spectral Graph Theory

#### 2.2.1 Kirchoff Matrix Tree Theorem

#### 2.2.2 Some properties of Laplacian

### 2.3 Electric Networks



## 3 Random Walk Approach

3.1 Aldous, Broder

3.2 Wilson



## 4 Matrix Approach

4.1 Colbourn, Dey, Nel

4.2 Harvey, Xu





## 5 Laplacian Paradigm

### 5.1 Kelner, Madry



## 6 Conclusion