

**Fun and Creative Problem Solving
in Mathematics and Computer Science**

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(28 January 2010, Thursday, 2:30—5:00pm)

Experience the fun of problem solving

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NUS USP
visits NYGH
on 02-02-10

What I do and like to do...

Research:
Design and analysis of algorithms
[算法设计与分析]
Transportation Logistics
Computational Biology
[生物信息学]

Selected Hobbies:
Mentor / Develop Talents
[SMP, SRP, UROP, etc]
National Olympiad in Informatics
[新加坡信息学奥林匹克竞赛]
International Olympiad in Informatics
[国际信息学奥林匹克竞赛]

Teaching:
Algorithms Design and Analysis
Discrete Mathematics
Graph Theory and Algorithms
Problem Solving in Computing
Invitation to Computer Science (USP)





[编程::极端应用软件::]
[24小时不间断编程大赛]

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Fun and CPS in Math-CS

Overview of Workshop







- ❖ **The Tourist Problem** 
- ◆ Hands-on Activity 1 & 2
- ❖ **Creative Problem Solving**
- ◆ Hands-on Activity 3
- ❖ **Overview of Math-CS Research Projects**



*Experience the fun of problem solving
in Mathematics and Computer Science*

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Student Assistants:

	Rachelle, NYGH, S3		Marie Dominique Chen, NYGH, S4
	Rachel Koh, HCI, JC1 (former NYGH)		Daniel Wong, HCI, JC2
	Wang RuoHan, NUS, SOC-UGrad		Melvin Zhang, NUS, SOC-PhD-Pgm

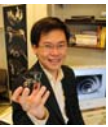
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Quote from Prof. Melvin Leok

"In research, you will have to become comfortable dealing with things for which neither you, nor anyone else, know all the answers.

It is tempting to spend time over preparing by reading books and papers, but at the end, there is simply no substitute for jumping right in, and learning things and finding things out for yourself along the way.

Do not be afraid of making mistakes, it is an integral part of the discovery and learning process."



Dr. Melvin Leok (Jan 2010)
Associate Professor of Mathematics, University of California, San Diego

ACPS class of 1987, RI class of 1991, RJC class of 1993,
B.S., M.S., 2000, Caltech, Ph.D., 2004, Caltech.

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Thank you!

If you want to contact me,
go email, MSN, FB at leonghw@comp.nus.edu.sg



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“Graduate” of similar Projects...

□ Melvin Leok (1992)

- ❖ GEP Research Project, S2, RI
- ❖ “Graph Colouring” with LeongHW



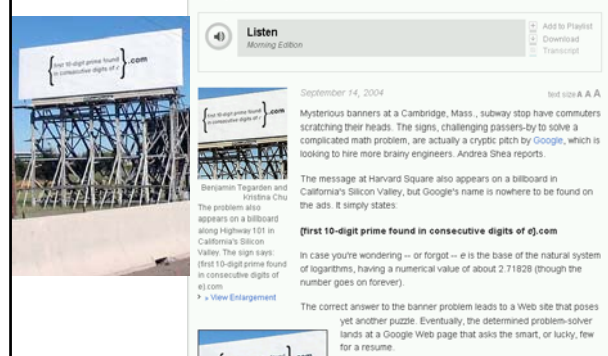
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Why do Google hire mathematicians?

Google Entices Job-Searchers with Math Puzzle



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Two sides of the same coin...

Mathematics and Computer Science

□ Mathematics

- ❖ Define solutions,
- ❖ Problem Formulation, Notations,
- ❖ Does solution exists, Prove properties of solution



□ Computer Science

- ❖ Defines input, output (solutions)
- ❖ Problem formulation,
- ❖ How to find solution, uses properties



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Faculty of Science and School of Computing

Proposal for Mathematics and Computer Science Double Degree

Presented by
Leong Hon Wai (Computer Science)
Zhu ChengBo (Mathematics)

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Mathematics and Computer Science are *siblings*

□ Foundations of CS are in mathematics

Alan Turing, John von Neumann

□ Structures and Systems in CS

Modelled and Analyzed with Discrete Mathematics

Many Common R&D Frontiers:

Computational Complexity,
Design & Analysis of Algorithms,
Optimization Theory and Algorithms,
Mathematical Modelling, Computer
Simulation,
Geometric Modelling,
Computer Graphics and Animation

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