



**Davidson Fellow Laureate
Yale Fan**

(\$50,000 Scholarship Recipient)



Personal Info

Yale Fan
Age: 15
Beaverton, Oregon

School, College and Career Plans

Yale is a rising sophomore at Catlin Gabel School. He is still considering his college choices and plans to major in physics. Yale hopes to pursue a career in research or as a professor.

Davidson Fellows Submission (*Technology*)

In his project, “Applications of Multi-Valued Quantum Algorithms,” Yale extended the binary quantum computational Deutsch-Jozsa and Grover algorithms to multi-valued logic problems. The Deutsch-Jozsa and Grover algorithms are among the first quantum algorithms designed for execution on a quantum computer. Yale discovered novel applications of these multi-valued algorithms and their computational advantages over the binary cases. The generalized versions of these algorithms are relevant to computer vision systems, search problems in economics, and space complexity issues in transportation, scheduling and manufacturing.

Biography

Yale became interested in quantum algorithms when looking for an internship at Portland State University. He feels his main contribution to the field of quantum computing is probing beyond the model of binary quantum computing and exploring the advantages of multi-valued algorithms.

In researching his project, Yale spent the most time learning the necessary material on quantum algorithms and poring over the literature to find what research had already been done. His mentor, Dr. Marek Perkowski, recommended Yale read various papers, sharing several of his own conjectures, and inviting Yale to his graduate seminars.

Throughout Yale’s education he has been interested in all subject areas, particularly science. He has participated in Stanford University’s Education Program for Gifted Youth writing program. Yale is a member of the Johns Hopkins Center for Talented Youth Study of Exceptional Talent. He also takes university-level mathematics courses.

Yale’s other interests include playing the piano, tennis, reading and visual art. He is a member of his school’s chess club, math club, Science Bowl team, and FIRST Robotics team.

Please see next page.



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(Cont.)

Honors/Awards

- 2007 Davidson Fellow Laureate
- 2007 Third Place Grand Award in Computer Science, Intel International Science and Engineering Fair
- 2007 Winner of Institute of Electrical and Electronics Engineers Computer Society Award
- 2007 Author of research paper accepted to the International Symposium on Multiple-Valued Logic
- 2005, 2006, 2007 Intel Northwest Science Expo Best of Fair
- 2006 Institute of Electrical and Electronics Engineers Technical Societies Award for Best in Computer Software Engineering
- 2006 Regional Science Bowl Team Captain, Second Place in Northwest Region
- 2006 President's Education Award for Outstanding Academic Excellence
- 2005, 2006 Discovery Communications Young Scientist Challenge National Semifinalist
- 2005 Johns Hopkins Center for Talented Youth Talent Search, First Place in Oregon State
- 2005 The Materials Information Society Materials Education Foundation Award for Material Science
- 2005 Madden Industrial Craftsmen Award

Community Activities

Yale is a member of the student editorial board for Cogito.org, an online community for talented students in science and math. Yale also volunteers as a mathematics tutor in the Portland area.

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