



**Davidson Fellow
Justin Solomon**

(\$25,000 Scholarship Recipient)



Personal Info

Justin Solomon

Age: 17

Oakton, Virginia

School, College and Career Plans

This summer Justin will be working at the Massachusetts Institute of Technology through the Research Science Institute. He will take college-level courses as a senior at Thomas Jefferson High School for Science and Technology.

Davidson Fellows Submission (*Technology*)

In his project titled "Identification of Differential Surface Properties on a Triangle Mesh for Facial & Object Recognition," Justin developed a new method for computerized object and facial recognition based on differential geometry concepts. Justin designed an algorithm to facilitate identification of objects and faces capitalizing on their unique three-dimensional features - such as concavity, ridges and curvature - whereas commonly-used recognition programs only extract two-dimensional features. Using three-dimensional scans of a subject increases the likelihood of accurate identification and has potential applications in security and personalization systems as well as in shape analysis, robotics and artificial intelligence.

Biography

Justin has acquired working knowledge of several computer languages and has worked with computer graphics, algorithms, artificial intelligence, Web site design, multimedia presentation and Internet programming. Justin taught himself differential geometry through an independent research project supervised by his Advanced Placement calculus teacher and continues to pursue college-level math, including differential equations and numerical analysis.

Through his participation in the USA Computing Olympiad, Justin was invited to the USA Invitational Computing Olympiad. His article "Programming as a Second Language," which he introduced at last year's National Educational Computing Conference (NECC) in New Orleans, was published by the International Society for Technology in Education in their magazine "Learning and Leading With Technology." This summer Justin is presenting papers at both the NECC and the Computer Science and Information Technology Symposium.

Justin lettered twice as a member of his school's computer team and will be captain next year. Through the Assistive Technology Club, Justin digitizes children's books for use in special education programs in local elementary schools.

Please see next page.

The Davidson Institute for Talent Development

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(Cont.)

Honors/Awards

- 2005 Davidson Fellow
- 2005 Intel International Science and Engineering Fair, First Place Grand Prize Award, Computer Science
- 2005 USA Invitational Computing Olympiad
- 2005 Department of Homeland Security Fellow
- 2005 Society of Exploration Geophysicists Award
- 2005, 2004 Office of Naval Research Naval Science Award
- 2004 Virginia State Science and Engineering Fair, First Place, Computer Science
- 2004 National Honor Society
- 2004 Science and Engineering Apprenticeship Program, George Washington University
- 2004 Boy Scouts of America Eagle Scout of the Year, Northern Virginia Training Center
- 2003 Future Business Leaders of America (FBLA) Letter
- 2002 State of Virginia, ThinkQuest USA 2002 Website Creation Contest, First Place
- 2001 Boy Scouts of America, Order of the Arrow

Community Activities

Through Boy Scouts, Justin has participated in many service projects, including working in the Second Harvest Food Bank warehouse and helping with Troop 152's annual mulch drive for five years.

Additionally, Justin is a music therapy volunteer at Northern Virginia Training Center where he plays the cello and piano for adults with mental disabilities. He also tutors students in honors biology, honors physics, and introductory and advanced computer science.

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