

## Informal parallel programming course for high school students Learn to Program the New UMD Desktop Supercomputer

Commodity computers, such as desktops, are undergoing a fundamental change, unprecedented since the advent of the computer in the 1940s. In the first chapter of computer history that spanned from 1946 through 2003, clock frequency improved at a stunning exponential rate. Beginning in 2004, clock frequency hardly improved due to implementation issues, such as power consumption. However, the number of transistors on a single chip continues increasing at an exponential rate and is expected to reach tens of billions by the year 2010, up from tens of thousands circa 1980. The 2007 fourth edition of *Computer Architecture: a Quantitative Approach*, by J. Hennessy and D. Patterson—perhaps the single most popular computer engineering textbook--summarizes the situation as follows: "...this fork in computer architecture means that for the first time in history, no one is building a much faster serial processor. If you want your program to run significantly faster ... you're going to have to parallelize your program."

Dr. Uzi Vishkin and his research team at the University of Maryland College Park have built a new 64-processor computer based on parallel processing on a single chip and capable of computing speeds 100 times faster than current desktop computers. Programming this computer requires an understanding of parallel algorithms, a topic not currently covered in high school programming classes, or even in many undergraduate computer science programs.

Students who participate in this informal course will acquire hands-on experience in parallel programming. For a recent UMD press release on the new computer, please see: [http://www.eng.umd.edu/media/pressreleases/pr062607\\_supercomputer.html](http://www.eng.umd.edu/media/pressreleases/pr062607_supercomputer.html)

### Participation

Participation will be by invitation only. Designated teachers will be asked to nominate highly motivated and capable students in line with guidelines given to them. Basic experience with a programming language such as C or Java will be assumed. No other background is required, but this informal course is not recommended for students who are intimidated by basic mathematical concepts, such as mathematical induction.

### Registration

Registration using the attached [registration form](#) and [consent and release form](#) must be done by Friday, August 31. There will be a \$10 charge for the tutorial. Your [check](#) needs to reach us by Tuesday, September 4.

### Format

A full day Saturday tutorial will be followed up by weekly 1-hour coaching sessions through the end of December, 2007.

### Tutorial

Tutorial date: September 15, 2007.

Place: University of Maryland College Park (room TBD)

Presenter: Professor Uzi Vishkin, Department of Electrical and Computer Engineering

### Coaching sessions (Coach: Scott Watson)

Location: Montgomery Blair High School, 3-4 pm on Tuesdays