Student Parallella and Student Pi

Suzanne J. Matthews

West Point

About the Parallella

- "Parallel Computing for Everyone"
- Advertised a slick IDE for programming

	Specs
CPU	1 GHz dual-core CPU, 16-core co-processor
RAM	1 GB
Disk	8GB+ µSD card
Cost	$149.00 (Desktop Edition), $99 (Microserver) Includes power supply + heat-sink

Specs Vs Cost

Item	Cost
Parallella Desktop Edition	$149.00
8GB microSD card w/adapter	$ 6.60
IoGear 4 port powered USB hub	$ 22.93
MicroUSB to USB (F) cable	$ 5.99
MicroHDMI to HDMI (F) cable	$ 2.96
Crossover Cable	$ 3.99
True Cost	**$191.47**

- Used Desktop Edition for parallel computing course
- Assumption: students would prefer it to Microserver
- Pros: Students can use it like a “real” computer
- Cons: Significantly more expensive than Microserver!

Integration into Course

- Students were required to use Parallella for first 4 programming projects
- Generated a series of "mini-modules" to aid student learning:
  - Parallella Setup
  - Connecting Parallella to SSH
  - Creating a Parallella cluster (1 hr)
  - Epiphany Programming Module

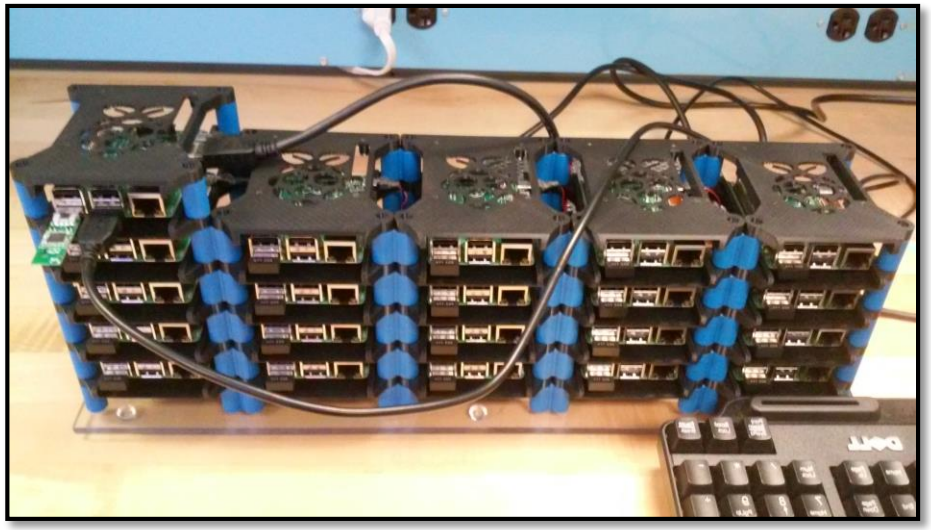
- Link: suzannejmatthews.github.io
- Case files: http://www.thingiverse.com/thing:892684

Observations/Conclusions

- Students preferred connecting via SSH to desktop interface
- Campus network policies a significant challenge
- Epiphany documentation/examples need significant work and improvement
- Very promising board, but has a steep learning curve!
  - Teaching materials and current advancements will lessen it
  - Why Epiphany instead of CUDA?
  - SBCs are worthwhile for use in the classroom.
- Published paper in CCSE-Eastern (to appear):
  Matthews SJ. "Teaching with Parallella: A First Look in an Undergraduate Parallel Computing Course". *Journal of Computing Sciences in Colleges*. To appear, 2015.

Student PI Cluster

- Pre-cursor to Parallella
  - Designed for course when I thought I couldn't get the boards
  - Case files: http://www.thingiverse.com/thing:892959
  - 1 hour setup module: http://www.suzannejmatthews.com/private/RaspberryPi_cluster.pdf
- Uses:
  - Independent studies
  - 1 paper published, 1 currently in the works



Thank you for listening!

- Questions?
- Relevant Parallella links:
  - Teaching materials: http://suzannejmatthews.github.io/
  - Case files: http://www.thingiverse.com/thing:892684
- Relevant Pi links:
  - Setup module: http://www.suzannejmatthews.com/private/RaspberryPi_cluster.pdf
  - Case files: http://www.thingiverse.com/thing:892959
- Budget Beowulf (SIGCSE'15) Files:
  - http://www.suzannejmatthews.com/private/cluster.html