Increasing Computer Science Awareness in High Schools and Colleges

IPRO 321

The Problem Defined

- Debunking myths and misconceptions
  - CS = Hacking
  - CS is not important
  - CS is all about programming
- Lack of interest in CS
- Lower minority and female enrollment
- Non-existing CS curricula in Chicago schools
- Social implications - globalization

The issues in perspective

- Relevant research:
  - CSTA
  - Dr. Jeannette Wing
  - University of Glasgow
  - etc.

Possible IPRO solutions

- New curricula
- Website
- Extra-curricular activities
- Special Presentations

Issues and shortcomings

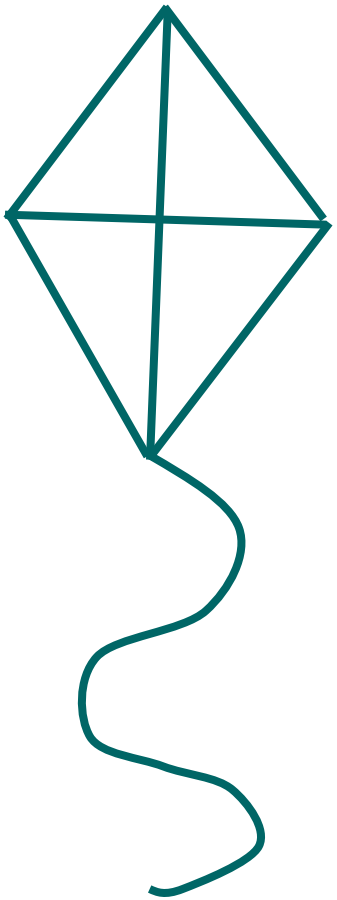
- High interference
- High maintenance
- Resource constraints

Our work: Presentations and activities

- Special Activities: Women's day and IPRO day
  - Short introductions
  - Interesting topics
  - Fun activities

Algorithms – Presented by Saad & Sergio

- Demonstrate how algorithms are common in our everyday lives.
- Activities: Follow a sheet with instructions that should output a kite drawing. Write “better” instructions to draw a kite.
- Observations: Some students were able to output the kite. Afterwards all students understood the concept of algorithms.

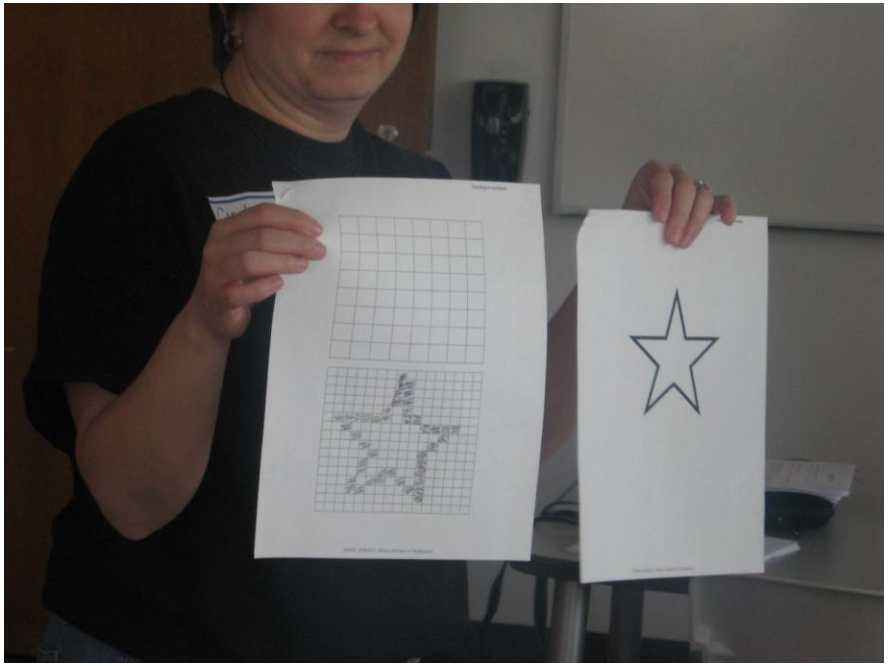


Scheduling – Presented by Qiao Qiao

- Explain how computer performs multiple tasks simultaneously with one processor.
- Activities: students play as processor, scheduler and tasks.
- Observation: some students already knew FCFS scheduling policy. Few misunderstood Round Robin.

Image – Presented by Jianqi Xing

- Explain how computer use numbers to represent and store image
- Introduce Bitmap and Vector Graphics, represent colors by number and basic of compressing data
- Activities: digitize and recover a image
- Observation: students have less knowledge than expected



Parallel Computing – Jason Chin

- Introduced the concept of parallel computing, its applications, and its limitations.
- Exercise: students navigated a sorting network to reach a specific order.
- Students gained a better understanding of the concept after the activity.

Results-Herbert Edwards

- Hypothesis:
  - Educating individual on simple computational process will increase their awareness.
- Methodology:
  - Pre- and Post-presentation surveys.
- Conclusion:
  - Indication of approximately 20% increase in understanding of the topics per presentation.

Ethical considerations

- ACM Code of Ethics
- Improvement of educational standards
- Obsolescence

Future work

- More presentations
- Better contact with administration
- More information and content for interested parties

Acknowledgments

- University of Glasgow, CSInside
- University of Canterbury, Computer Science Unplugged
- Jeannette Wing, Joanna Goode and others who have done extensive research on this problem

Questions?

…don’t be shy