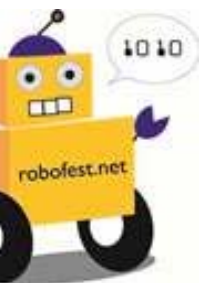


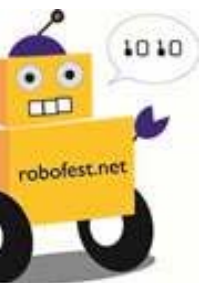
Fostering Creativity through Global Robotics Art Festival (GRAF)

CJ Chung
Lawrence Technological University



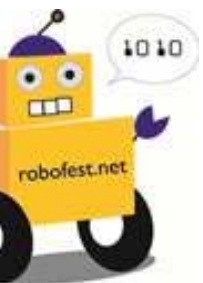
Fostering Creativity through Global Robotics Art Festival (GRAAF)

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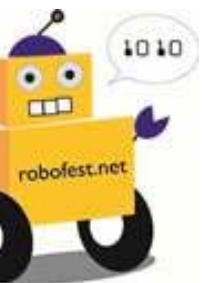
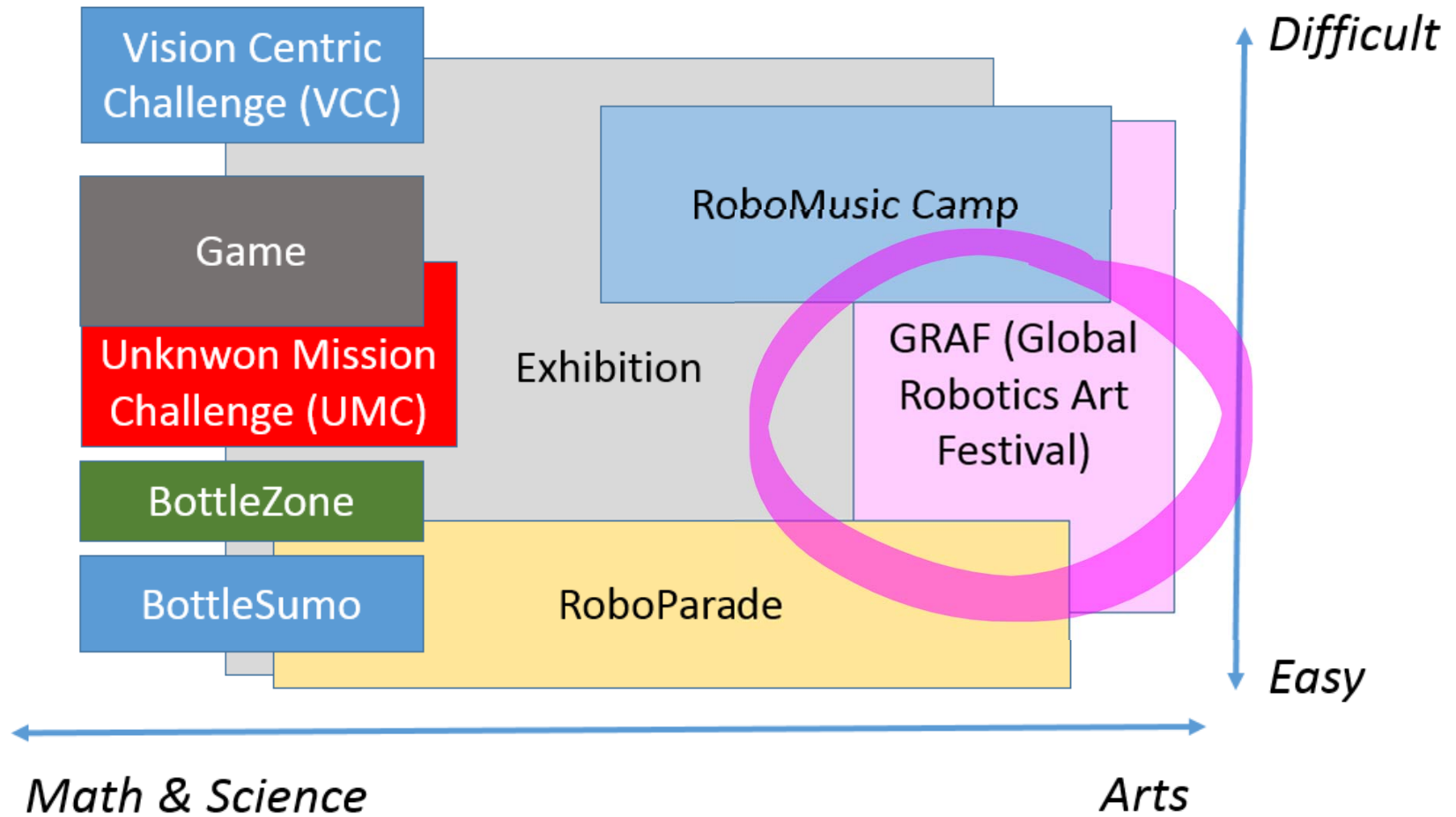


Why Arts and Robots?

- Art is about expressing creativity
- People love arts that have also strong connection with all the S. T. E. M components
- Robotics is all about the STEM
- The combination of the two would create a true interdisciplinary (wide), in-depth, and lifelong natural learning environment fostering creativity

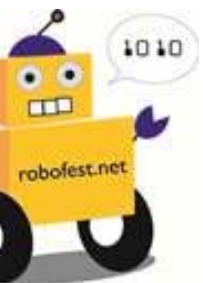


Robofest is Wide and Deep



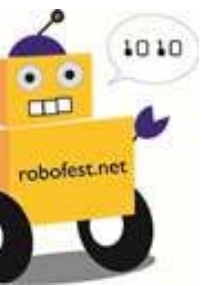
Definition: Robotics Art

- Any artwork that employs some form of robotic or automated technology
- programmed to respond to viewer interactions, by means of computers, sensors and actuators



The goals of GRAF

- To attract more students to pursue STEM fields
- To prepare them to excel in advanced education
- To promote/foster creativity





GRAAF



Global Robotics Art Festival

- Inaugural event
- November 23, 2013 9am-4pm, Macomb Community College Expo Center
- Robots must have computational components programmed by participants and must employ sensors
- Open to students grades 4-12
- Performing Arts & Visual Arts divisions





Global Robotics Art Festival

Performing Arts Division: suggested categories

- Dance
- Synchronized Group Dance
- Fashion Show
- Music Band
- Robot and Human Playing music together
- Robotic musical instruments played by humans
- Robot Skit





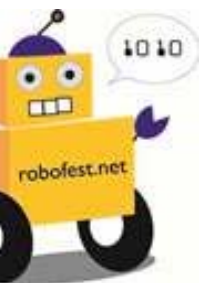
GRAAF



Global Robotics Art Festival

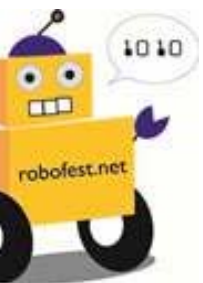
Visual Arts Division

- Kinetic Sculptures
- Kinetic Canvas
- Robotic Painting

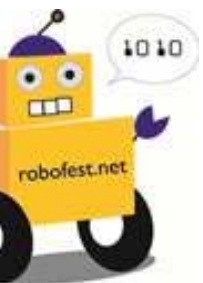
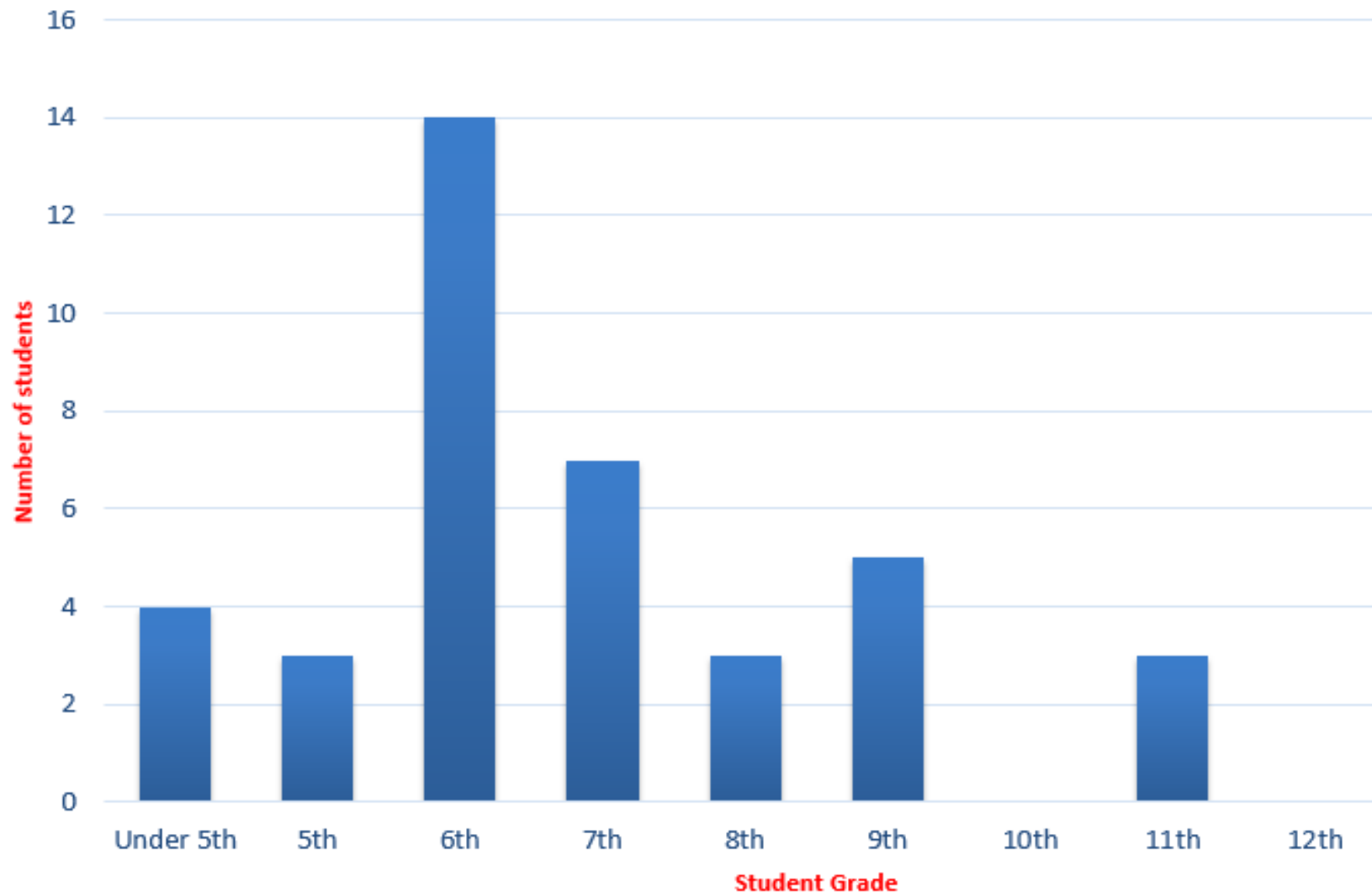


GRAF 2013 Participation Data

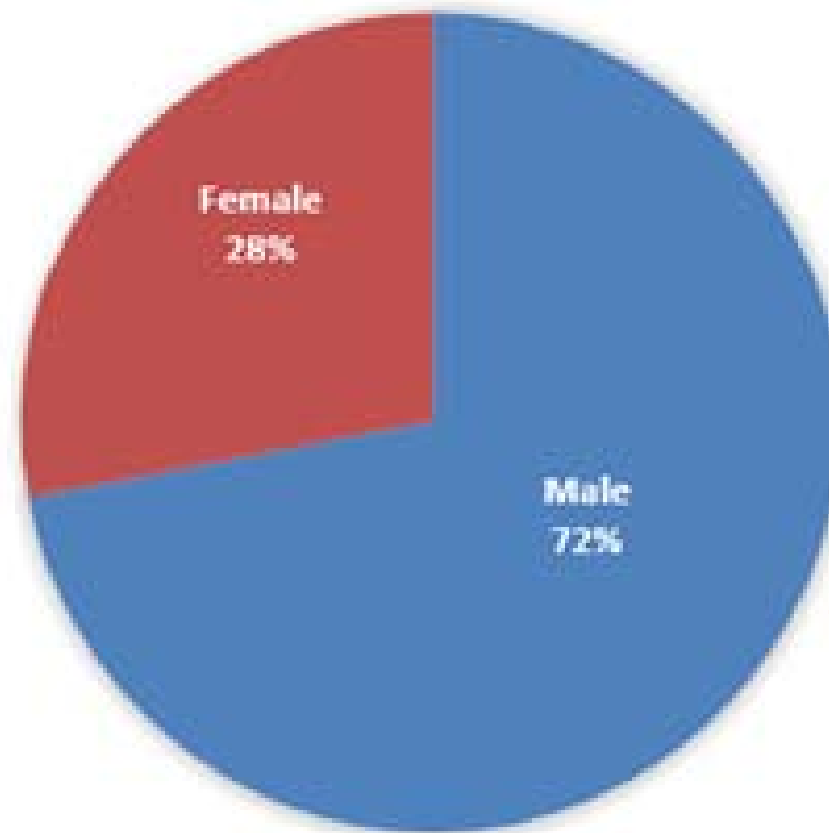
- 15 teams registered
- 13 teams came from Michigan and Ohio, Canada, and Mexico
- A total of 39 students
- Average team size was 3, which provides an ideal learning environment to develop both independence and collaboration for the “TEaMS (or STEaM)” paradigm.



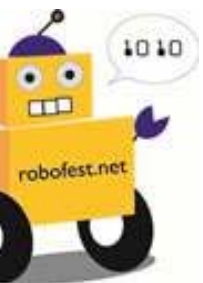
79% were young students in either elementary or middle school



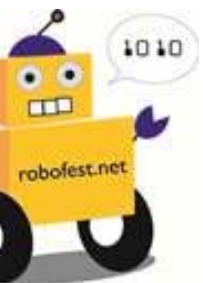
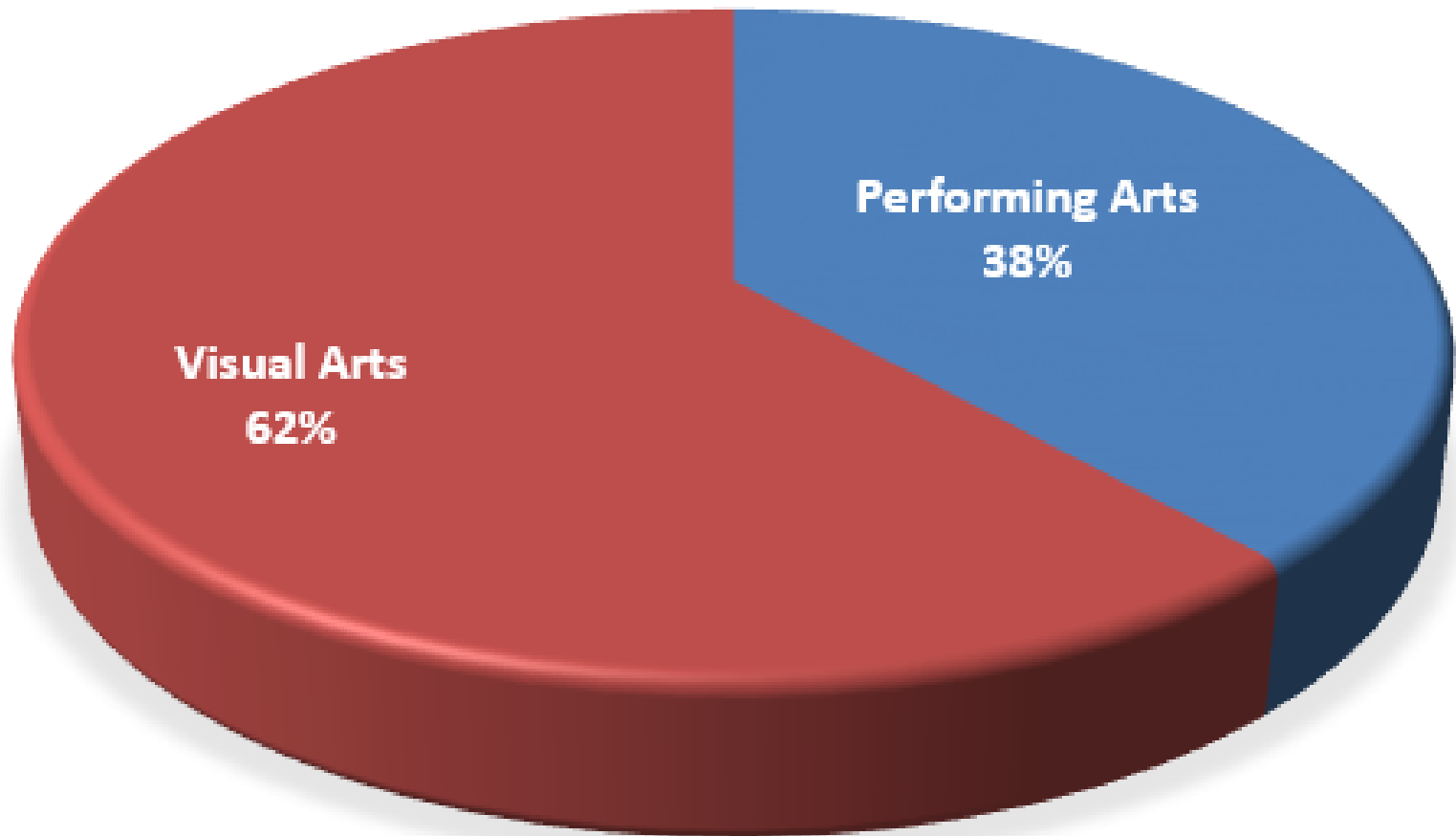
28% of the participants were female students



higher than the female college student participation rate - ~15%, in college engineering programs



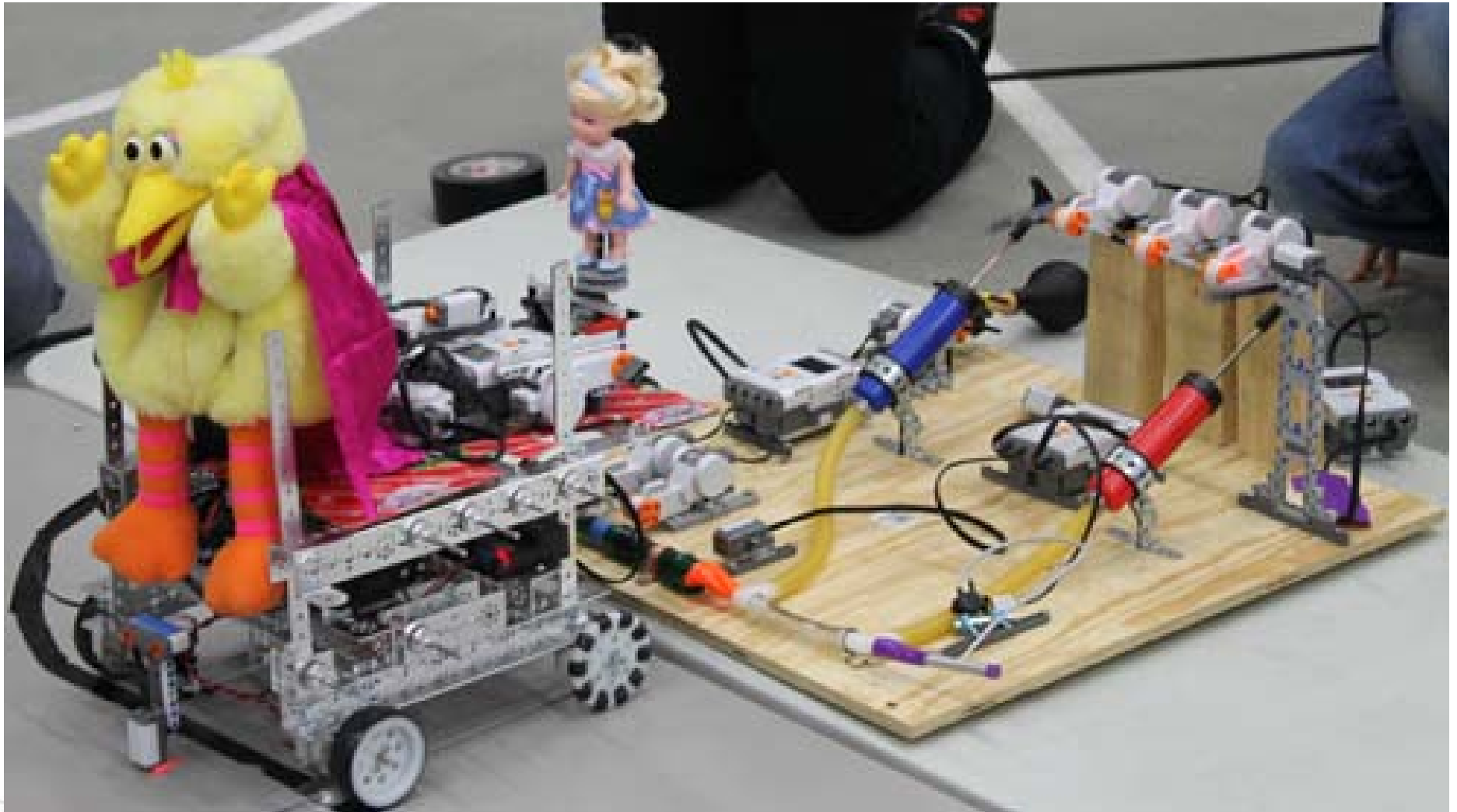
PARTICIPATION CATEGORIES





See how creative they are!

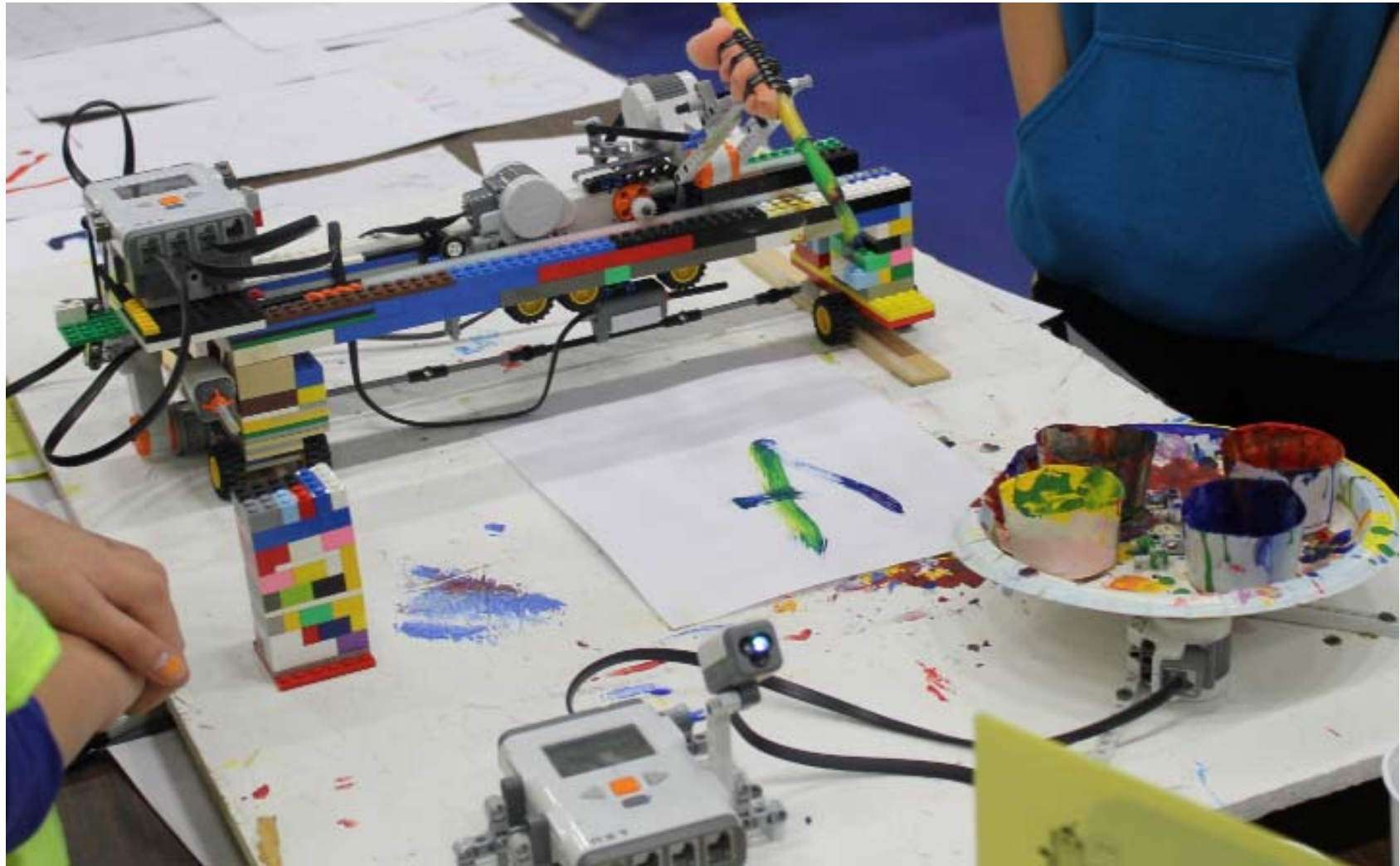
Performing Arts Entries



<http://youtu.be/i7geHoEib1I>

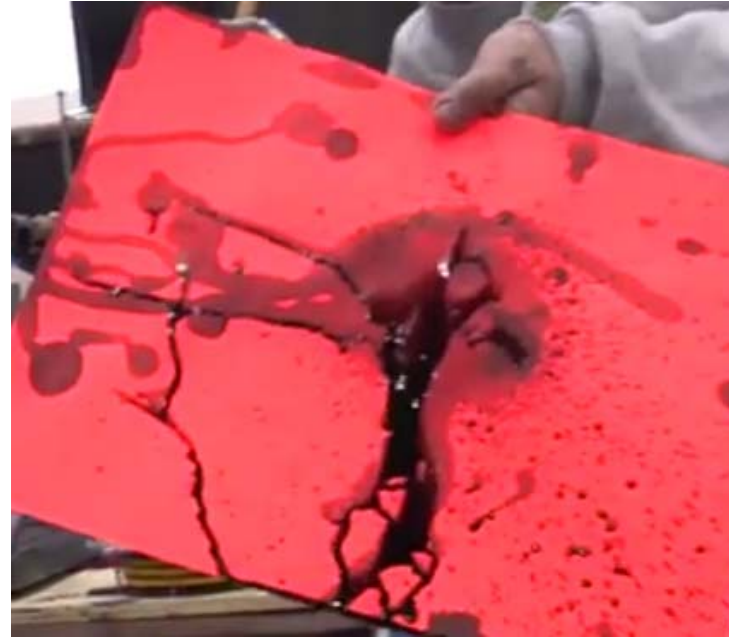


Visual Arts Entries



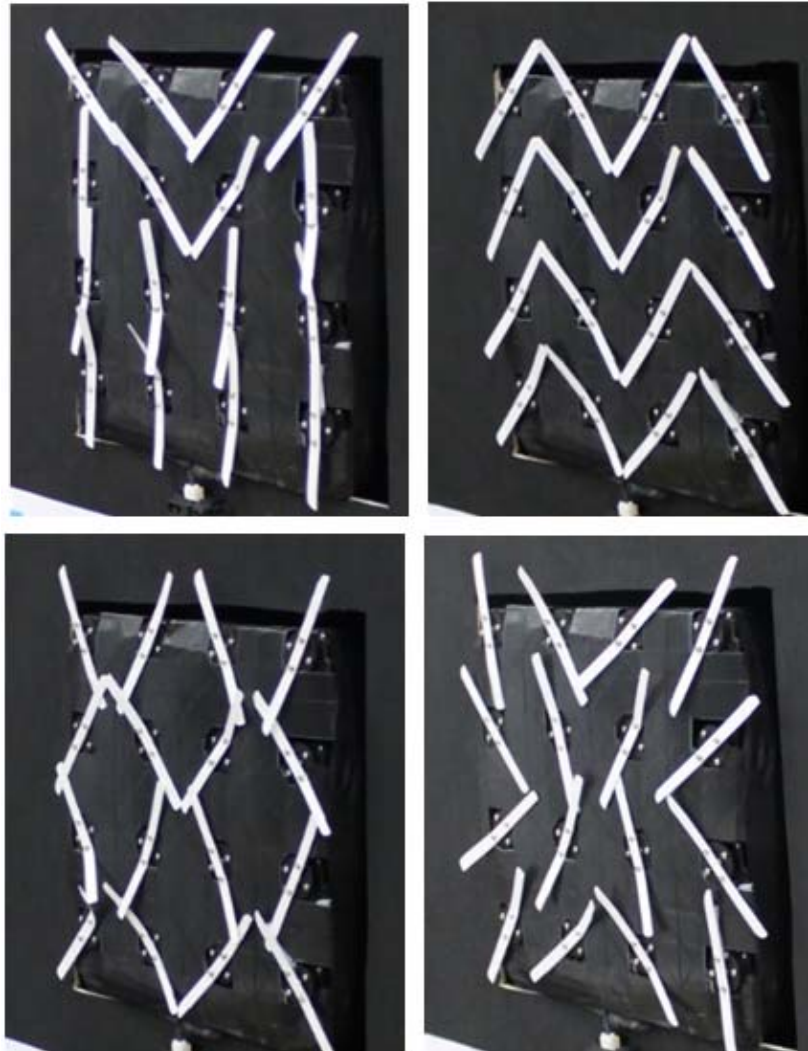
<http://youtu.be/E9Qj8xaxqGI>

Mood Painter

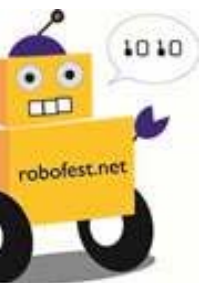


<http://youtu.be/dUhMSFq4lpg>

MARGO – Kinect Art Patterns

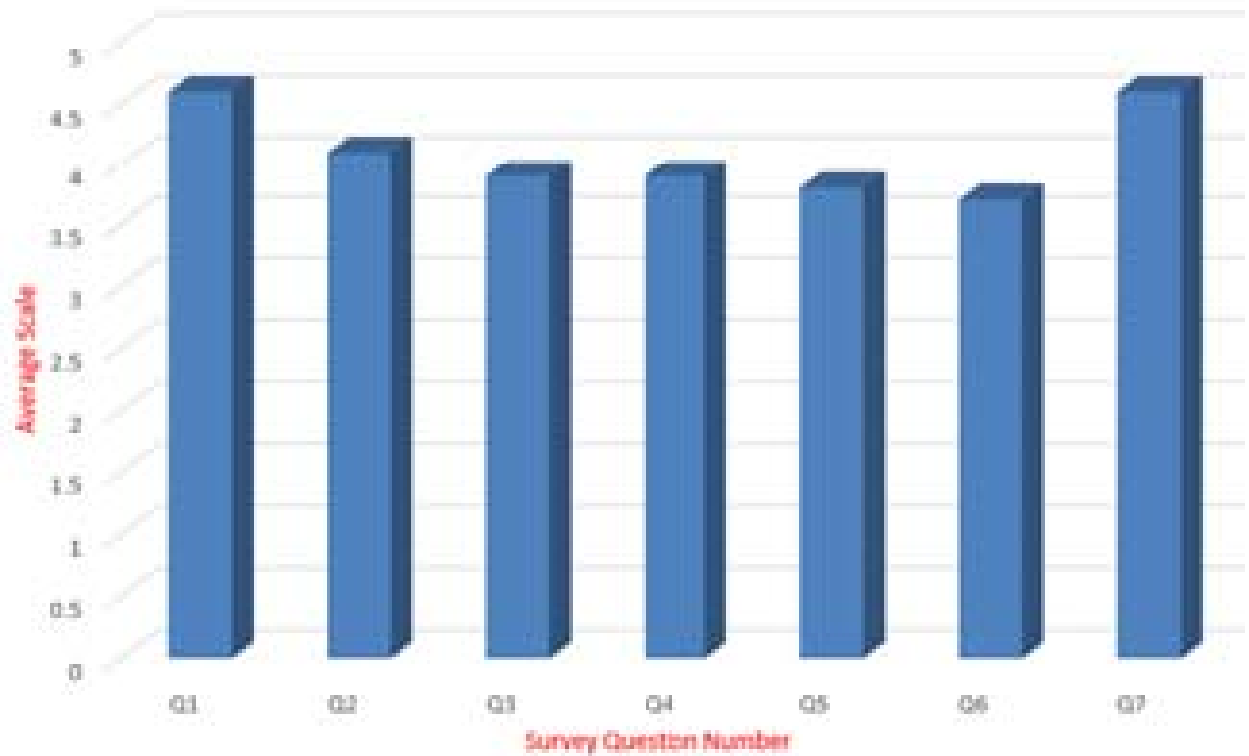


<http://youtu.be/MmEOs2wgTI>



Survey Results

- 5: Strongly agree
- 4: Agree
- 3: Neutral
- 2: Somewhat disagree
- 1: Disagree



Q1. I had fun doing robotics arts project

Q2. I am interested in a career or job involving Science, Technology, Engineering, or Mathematics (STEM)

Q3. Combining robotics and arts gave more motivation to learn STEM than traditional STEM only projects.

Q4. Doing a hands-on project combining robots with arts makes me want to learn more about STEM

Q5. I am more likely to take STEM related classes after this event

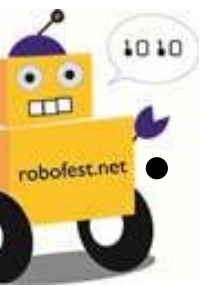
Q6. *I am more likely to take arts related classes after this event*

Q7. I would like to participate in GRAF next year too.



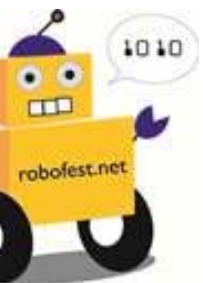
Survey Comments

- *It was fun. (x 4)*
- *This project was very enriching and interesting because besides of the robotics part, I'm a musician.*
- *I'm very impressed about all the robots. They are great.*
- *I had a lot of fun designing this project, but I would prefer a standard competition like Robofest.*
- *Very good organization.*
- *More people should know about this and participate.*
- *I like everything.*
- *I am going to do more robotic arts after this event.*
- *It was a very good idea to mix robotics and art and I am looking forward to next year.*
- *I really enjoyed it!!*
- *Love it!!!*



Summary & Conclusion

- Fun, beauty, and joy
- Express, discover, and create
- Female and young students friendly
- Possibly an effective way to improve STEM fluency since students felt they gained knowledge in STEM subjects
- STREaM: STEM, Arts, and Robotics



Future Work in 2014

- Developing rigorous methodologies to measure and assess STREaM successes
- Assessing the degree of creativity learning through GRAF 2014 (Oct. 25, 2014 at Macomb Community College, Michigan)

