SQUIGGLE NANOMANIPULATOR
ROCHESTER INSTITUTE OF TECHNOLOGY

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THE P13372 TEAM
(From L to R: Behm, Rosebrook, and Noor)

PROJECT TIMELINE:
September 2012
• Gather Background Information
• Interview With Customer

October
• New Scale Visit
• Acquire Hardware
• System Design

November
• System Selection
• Detailed Design
• Hardware Testing

December
• Acquire all BOM components
• 3-axis Movement Test
• Redesign

January 2013
• 3-D Print the Parts
• 3-Axis Movement Test
• Redesign

February
• Mounted to Microscope
• Final Tests
• Technical Paper and Poster

PROJECT PARETO CHART:

MISSION STATEMENT:
• Develop a low-cost, high resolution, three-axis Cartesian nanomanipulator that is easy to use.
• Utilize SQUIGGLE piezoelectric linear actuators from New Scale Technologies.
• Implement nanomanipulator for RIT’s Nano-Bio Interface Laboratory’s breakthroughs in nanoscience.

SYSTEM CONCEPT SELECTION:

- Spring and gravity return forces type systems were selected
- Magnets were first ignored due to tracking sensor interference but were found to work best in the end.

PROJECT PARETO CHART:

SYSTEM OVERVIEW:

- Spring System Design (CAD)
  - Spring System Design turned out to be less complex and lighter
  - Spring System was decided to be the final system after first term of MSD

FINAL KNOWLEDGE:
- Total budget of the project reached no higher than $700, of which over $270 was on spare parts.
- Friction plays a huge role for the SQUIGGLE motor
- Implementation on microscopy was a success

ADDITIONAL INFORMATION: For additional information visit our team website online at https://edge.rit.edu/content/P13372/public/Home

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