

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING**

2.671 Measurement and Instrumentation

Go Forth and Measure Poster Titles

Dec 9, 2008

Go Forth and Measure is a self-directed assignment created by Prof. Ian Hunter for 2.671 to give the students an opportunity to make measurements on something of personal interest to them. In the past three semesters, this project expanded to a full-semester project, including a research proposal, preliminary results, rough draft, and final copy of a research paper. Last term we decided to give students an opportunity to present their work publicly in a poster session. This term there were 70 posters with topics in five main areas: Health, Fitness, and Sports; Acoustics and Music; Science Fun; Transportation; and Student Life.

Health, Fitness, and Sports

No.	Title
1	Caffeinated Drink: To Drink or not to Drink?
2	Joint Accelerations Under Different Running Conditions
3	Blood Pressure Changes Due to Varying Workloads
4	Investigation of Pace and Run Synchronization in Jogging Partners
5	The Long Term Effects of Weekly Exercise on Heart Rate
6	Maximizing Jump Height
7	Breathe Easy: The Correlation between Height and Effect of Seated Position on Lung Capacity
8	High Jump Approach Speed and Curvature
9	Comparison of Heart Rates during Various Sailing Drills
10	Dynamics of a Soccer Kick
11	Developing Techniques to Measure Sail Strain
12	Internal Pressure and the Bouncing of a Basketball
13	Comparing Acceleration of Oar and Shell in Rowing Strokes
14	Bump, Set, Spike: Determining Volleyball Players' Spiking Skill Level
15	Comparing the Effects of Fluid Dynamics with Psychological & Physiological Effects on Speed in Swimming
16	Effect of Topspin-Slice on Tennis Ball Trajectory After Initial Bounce
17	The Initiation of Somersault Rotation
18	Shuttlecock Instantaneous Velocity in Badminton Smash
19	Comparison of Tip Acceleration of Fencing Weapons
21	The Force of a Punch as Related to Training and Technique
22	How Hard Can You Hit?
23	Comparison of the Strength of Four Martial Arts Hand Techniques
24	Examining EMG during a Weight Throw
25	Understanding a Taekwondo Kick
26	Computing One Repetition Maximums without Muscle Failure
28	Examining Human Force & Power Output During Power Cleans

Acoustics and Music

No.	Title
30	A Comparison of Speech Patterns of Native and Non-Native Speakers
31	Acoustical Properties of 3-370
32	Classifying Organ Stops by Harmonics
33	Nonlinear Vibration of Elastic Strings
34	Harmonic Overtones on a Violin
35	Improving Sound Quality through Acoustical Analysis and Behavior Identification
36	Analyzing the Harmonic Structure of Piano Tonal Frequencies
37	Quantitative Comparison of Analog and Digital Music Formats
38	Investigation of the Pitch Precision of Various Musical Instruments
39	Tolerable Discrepancies for Audio/Video Synchronization in Television Programming

Science Fun

No.	Title
40	The Coke & Mentos Geyser
41	Measuring the Energy Loss of a High Five
42	The Cooling Capabilities of Aerosol Cans
43	Muzzle Velocity of a Potato Cannon
45	The Relationship between Sound Intensity and Projectile Velocity of a BB Cannon

Transportation

No.	Title
48	Cooling System for a Formula-Style Race Car
49	Load Distribution in the Spokes of a Bicycle Wheel
50	The Effect of Scale on Automotive Acceleration and Handling
51	Mapping the Potholes: Road Surface Quality around Boston
52	Skid pad performance over various temperature of tires
53	Longfellow Bridge is Falling Down
54	Effects of Weight on Automotive Handling

Student Life

No.	Title
55	Sound Pressure of a Roommate's Snore
56	Measuring sleep breathing rates to detect sleep apnea
57	The Peak Activity Hour of a Dormitory Residence
58	Road Noise on Memorial Drive
59	Indoor Air Quality in various MIT Locations
60	Effect of Various Sound Range on Dancing
61	Carbon Monoxide Levels Across the Harvard Bridge
62	The M.I.T. Social Scene's Effect on Hearing
63	Fountain of Truth: An Investigation into MIT's Water Fountains
64	Turn Down the Music: Measurement of Music Intensity in Dormitory
65	Transient Heat Transfer in Deep Fried Pastries
66	Using a Television as a Heater
67	Clicking patterns in Warcraft III
68	Laptop Heat Generation During Charging
69	How Sensitive is the iPod Touch?
70	Temperature Profiles of Coffee Cup and Thermal Sleeve Combinations

Miscellaneous

No.	Title
27	Exploring the Effect of Hand Placement on Efficiency of a Lever-Powered Wheelchair
29	Measuring the Efficacy of the Smokeless Stove
44	Measuring Shear Modulus Characteristic of an Assortment of Common Wood Types
46	Analysis of Vortex Shedding Frequencies Off Rectangular Cross-Section Beams
47	2D System Trajectory Reconstruction Using Beam Mounted Accelerometers