Georgia Institute of Technology
The George W. Woodruff School of Mechanical Engineering

Automation and Mechatronics Seminar

"Can Newton's Third Law be Questioned?"

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Georgia Institute of Technology

Wednesday, April 4, 2007
MRDC Building - Room 4211
3:30 p.m.

Newton's three laws of motion (1687) are undoubtedly one of the major pillars in engineering. Newton's second law of motion, briefly stated as force equals mass times acceleration, is empirically true for particles with low speed. Newton's first law of motion, briefly stated as if force is zero, then velocity is constant, follows naturally from the second law. Newton's third law, briefly stated as action and reaction forces are equal, opposite, and collinear, is however never this straightforward. When we use the Newton's third law, we actually only use its consequence (such as the equation of moment of momentum), instead of the law itself, which is not easy to be directly verified. In the past, it has been well recognized that Newton's third law fails for magnetic forces between charged particles. However, there has been much less doubt for some more traditional cases such as rigid bodies. This seminar will introduce an approach to examine the Newton's third law. We will study some "mechanical engineering" cases. But what if, after this, we find that the third law has a hole?

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