The Optical Mouse as an Inexpensive Measurement Device

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Until recently, the operation of computer mice had been based almost exclusively on the rolling ball principle. Popularly called the mechanical mouse, it houses a rubberized ball that rolls according to the planar movement imposed on the mouse. Two rollers located within the mouse are in constant contact with the rubberized ball. One of the rollers detects for motion in the x-direction whereas the other detects for motion in the y-direction. Quite naturally, the mechanical mouse suffers from the problems of wear and dirt accumulation over time. For this reason, it is common to find them incapable of registering movement after several months of heavy usage. In 1999, Agilent Technologies unveiled the first optical mouse that was immune to the problems of wear and dirt accumulation. With resolutions currently reaching 0.03175 mm, optical mice are gradually replacing their mechanical predecessors as the pointing device of choice in computers. Due to the economics of large volume production, the cost of an optical mouse is extremely low. Currently, it is possible to acquire a reasonably good quality unit for as low as US$20. Here, the viability of the optical mouse in measurement applications is demonstrated. These applications range from static, quasi-static to dynamic forms. This portends the possibility of creating a wide range of low-cost but engaging experiments for students.