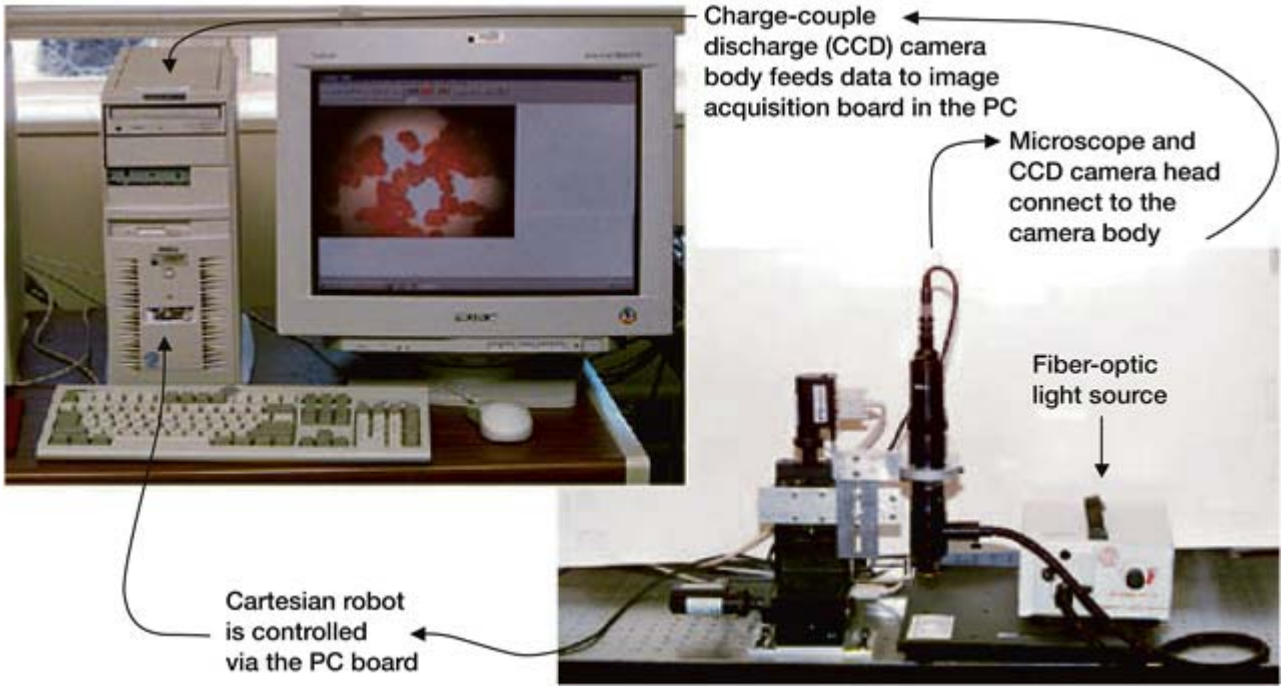
Compact Microscope Imaging System With Intelligent Controls Improved

The Compact Microscope Imaging System (CMIS) with intelligent controls is a diagnostic microscope analysis tool with intelligent controls for use in space, industrial, medical, and security applications. This compact miniature microscope, which can perform tasks usually reserved for conventional microscopes, has unique advantages in the fields of microscopy, biomedical research, inline process inspection, and space science. Its unique approach integrates a machine vision technique with an instrumentation and control technique that provides intelligence via the use of adaptive neural networks. The CMIS system was developed at the NASA Glenn Research Center specifically for interface detection used for colloid hard spheres experiments; biological cell detection for patch clamping, cell movement, and tracking; and detection of anode and cathode defects for laboratory samples using microscope technology.



The CMIS system.

Long description. The charge-couple discharge (CCD) camera body feeds data to the image acquisition board in the PC. The cartesian robot is controlled via the PC board. The microscope and CCD camera head connect to the camera body. The fiber-optic light source is shown.

This imaging system has many potential commercial uses, including automated inline inspection of precision parts, medical imaging, security industry applications (examination of currency in automated teller machines and fingerprint identification in secure entry locks), environmental industry applications (automated examination of soil

and water samples), biomedical field applications (automated blood and cell analysis), and microscopy.

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