Camera-less Smart Laser Projector

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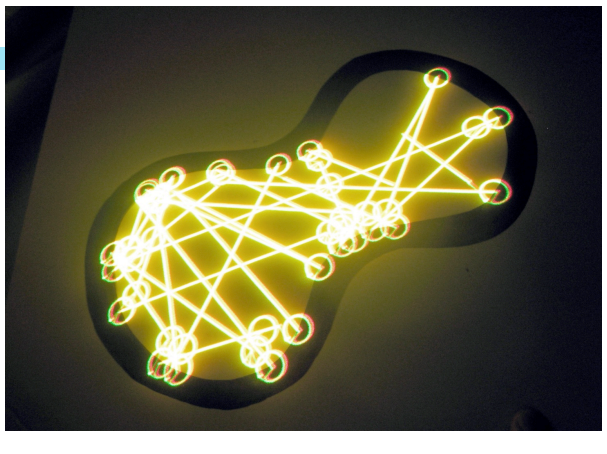
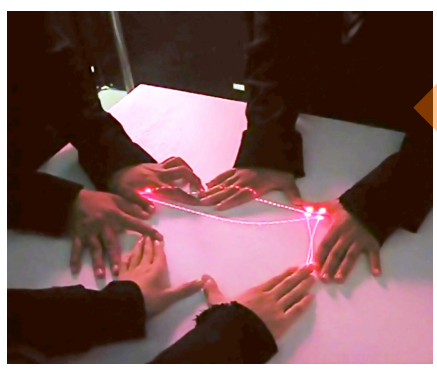


What? A modified laser projector capable of displaying over all kind of non-prepared surfaces**, while simultaneously using the beam (at the same or different wavelength or polarization) as a LIDAR probe gathering information about that surface's position, orientation and shape, texture and spectral reflectance**. This information can then be used to augment the surface with graphics, or compensate the geometry and contrast of a raster image on the flight, without the need of projector/camera calibration.

Applications? dermatology, non-destructive control, authentication, and in general all sort of AR applications using any available surface for projection (tables, desktops, wall and floor, but also human skin, printed material and paintings, market products on a shelf, etc).



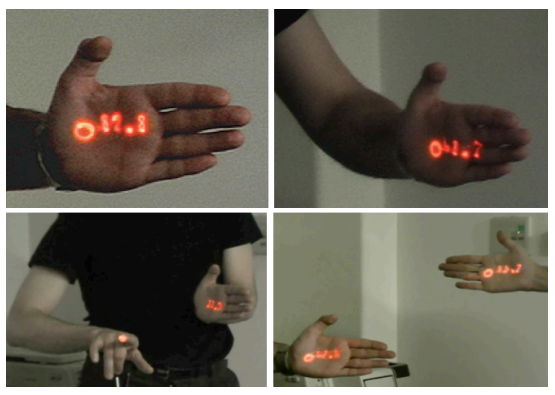
Entertainment

SLP in "vector-mode" as used in the "scoreLight" musical instrument and the "Sticky Light" media-art installation to augment hand-drawings.

We are now working on large scale augmentation such as interactive games on ski-slopes.

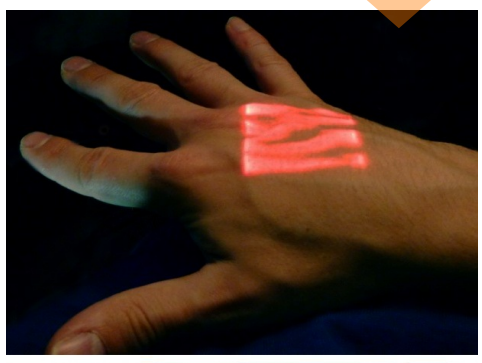
Human-Computer interface and ubiquitous displays

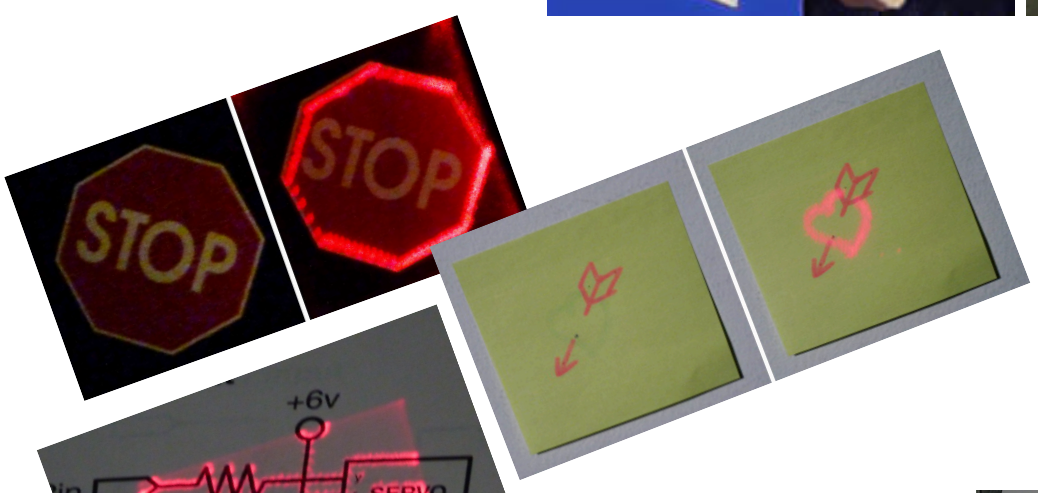
The SLP principle can be used as a markerless tracking device for human-computer interaction (capable of both input and output).

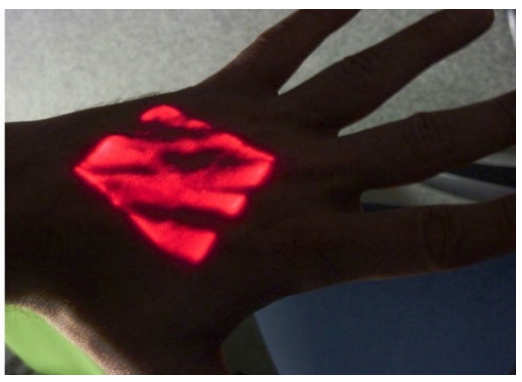


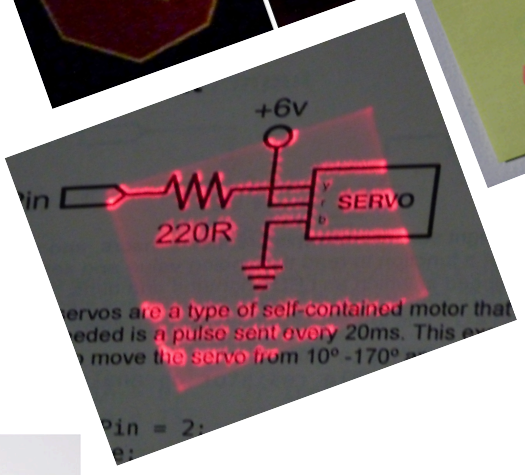
Augmented Reality with 'intelligent' lighting

Synthesis of an artificial reflectance for contrast enhancement, vein visualization, and 'artificial fluorescence'.

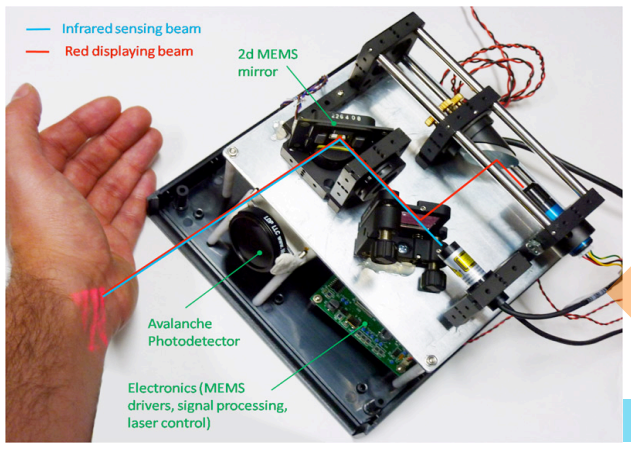








Augmented reality survey with the SLP (capable of measuring depth, and modulating the visible light accordingly to show contour lines (concept image).



We developed two prototypes, one using relatively bulky galvano mirrors, and another using resonant micromirrors. Research is underway for **designing a miniature `sensing-projector' that could be embedded on mobile phones or attached to everyday objects or surfaces (including walls, cars or clothes).**

www.k2.t.u-tokyo.ac.jp/perception/SLP/