
# 2D/3D Optical/Range/Scene Flow, 2D/3D Tracking and Plant Growth from 3D Range Data

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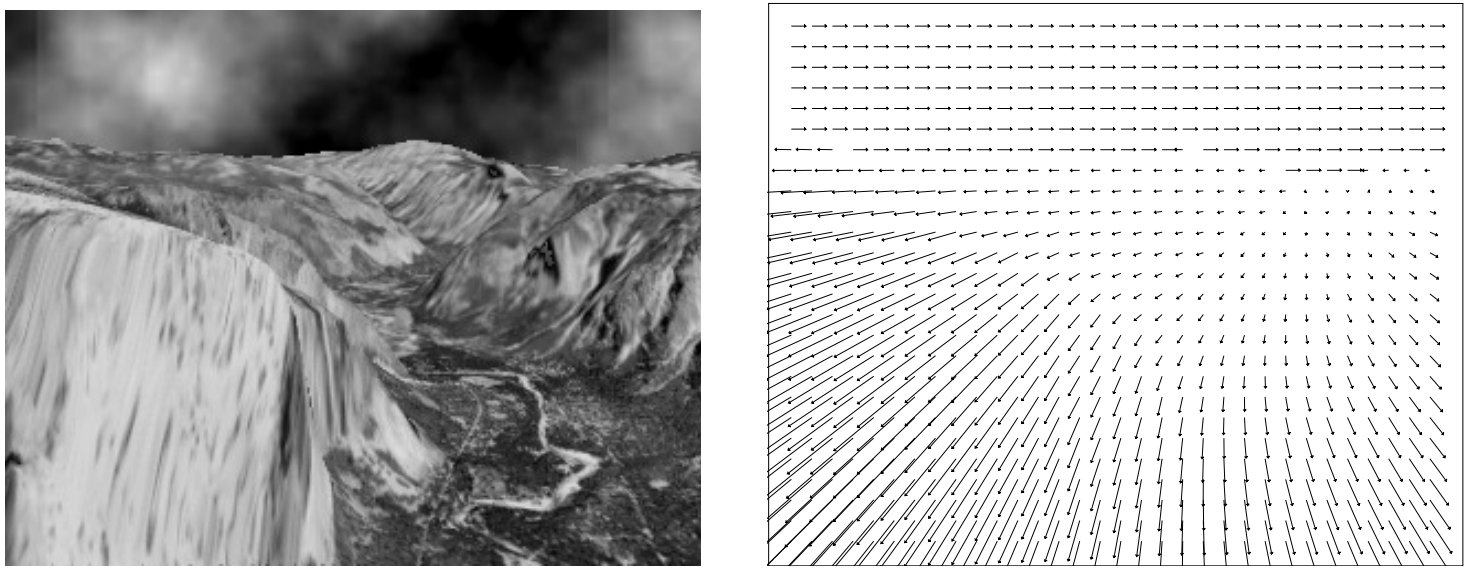
# Activities/Courses

- Acting Chair of Computer Science 2016/2017
- CS2035b - Data Analysis and Visualization (MatLab) Monday and Friday 4:00pm to 5:30pm, HSB2036.

# Computing Optical Flow



(a) (b)

(a) The middle frame from the **Yosemite Fly-Through** sequence and (b) its correct flow field.

# Examples of Recent/Ongoing Research

- Computing 3D Optical Flow for gated MRI data of the left ventricle of a beating human heart using a model of the left ventricle [with Prof. Huang Fang, CSU]

- Scene flow (stereo depth maps plus left/right 2D optical flow) versus Range flow (3D depth maps and the $X$, $Y$ and $t$ derivatives) to compute 3D optical flow of surface points (with Seereen Noorwali)

- Detecting Tornado "hook echos" in Doppler weather data, computing 3D wind velocity as 3D optical flow using dual Doppler radar and Wind-profiler data, computing long storm trajectories in Doppler weather data (with Bob Mercer, Hongkai Wang, Yong Zhang and many others).

- Using 3D point clouds of multiple views of a growing plant (and the closed 3D triangular meshes computed from their registration) to non-invasively measure the 3D growth of the plant, using its 3D height/area/volume measurements and the 3D areas of its canopy and individual leaves (with Ayan Chaudhury)

- Computing hierarchical 3D Scene/Range flow from synthetic (ray traced) and real car driving sequences (with Seereen Noorwali)

- Computing 2D optical flow at occlusion using segmented closed occlusion regions (with Hua Meng)

- Computing motion and structure from optical flow in a sequence of x-ray images of a bending knee event (with Yves Pritchard).

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