Old-School Computer Vision Teaching Modern Deep Networks

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In the last five years, computer vision systems abandoned old-school, “tailored” methods in favor of newfangled deep networks. But taking advantage of these new, deep methods often requires large, rich sets of labeled training examples and collecting such sets can be prohibitive. This talk proposes leveraging older computer vision systems as sources for such labeled training data whenever ground truth labels are difficult to get: using the older, tailored methods to synthesize training labels. The talk provides examples related to 3D face shape estimation---where obtaining ground truth labels is often particularly challenging---and presents results for single-view 3D face reconstruction, viewpoint estimation, facial deformation fitting, and mid-level detailing. These results show that despite their synthetic training labels our networks perform exceptionally well. In fact, though possibly counterintuitive, our networks surpass even the old-school methods used as their teachers.