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Gathering light

Kari Pulli
Computational Imaging at Light, USA

With digital cameras in every cell phone, everyone is a photographer. But people still aspire to the better zoom, the lower noise, and the artistic bokeh effects provided by the digital SLR cameras, if only these features were available in as convenient and light-weight a package as a cell phone or a thin compact camera. Traditional high-end cameras have a big lens system that enables those features, but the drawback is weight, bulk, and inconvenience of carrying and switching lenses. In this talk, we discuss an alternative approach of using a heterogenous array of small cameras to provide those features, and more. Light's camera technology combines prime lenses that provide an optical zoom equivalent of 35 mm, 70 mm, and 150 mm lenses. Small mirrors allow reconfiguring the cameras to select the right level of zoom and field of view. This talk describes the architecture of this flexible computational camera.

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Facial animation through reverse engineering of actions to thought processes

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I propose a method where facial animation for characters can be derived as a result of reverse engineering from the final action on the storyboard to the thought train driving the action. For this process, we classify actions into conscious, subconscious and unconscious actions, and derive the lesser obvious subconscious and unconscious parts leading to the conscious action. We begin by analyzing the situation at hand, and how it applies to each character in it. Then we use the storyboards to understand the primary action of the character. Here we study the face of the character, i.e., his expression, and the body language, i.e., the line of action and the pose. Then we proceed to analyze the possible references to the past of the character that could drive the action. Here, we try to reason things he might have seen or heard and his own internal reasoning that lead to his interpretation of the situation and the consequent action. Finally we derive the inner monologue of the character that drives the action. Once we finish the reverse engineering from the action in the storyboard to the thoughts and emotions, we map the eye darts, blinks, eyebrow movement, leading actions and its required anticipations within the time frame stipulated by the storyboard. This method of reverse engineering-based animation results in greater cohesive acting throughout a film, and creates greater connect with the audiences.

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