Forget fun. Blondes have more light scattering. It’s a law of nature: Sunlight bounces longer within a head of blond hair. This makes it look light and bright. Iman Sadeghi, M.S. ’08, Ph.D. ’10, a computer scientist, captured this natural phenomenon with a new computer system, and used it to light up Rapunzel’s 70 feet of blond, magical hair in Tangled, Disney’s recent animated feature.

Sadeghi developed an “artist-friendly hair-shading system” for Walt Disney Animation Studios that enabled Disney artists to control the sheen, color and highlights of Rapunzel’s hair as they transformed reference paintings and photographs into animated images. The hair shader was then integrated into Disney’s production pipeline and used for all types of hair—and fur—in Tangled.

“As engineers, it’s a good idea to know how the end users want to control the system,” explains Sadeghi. “Otherwise, you end up with something that is not as useful as it could be.”

Getting computer graphics breakthroughs onto the silver screen is a UCSD tradition. In 2004, Sadeghi’s Ph.D. advisor, Henrik Wann Jensen, a computer science professor, won an Academy Award for work that brought life-like skin to animated characters such as Gollum in Lord of the Rings.

—Daniel Kane