The research of Professor Cai is focused on biomedical video analytics and interactive visualization that combines human motion perception and machine vision, as a part of “Instinctive Computing” (Springer-Verlag, 2016). His current project is to develop a computational “dashboard” to measure the quality of diagnostic examinations from real-time colonoscopy videos in endoscopy labs. He has also been working on “Ambient Diagnostics” (CRC, 2014) for affordable medical diagnoses using mobile devices, webcam, smart tattoo, pill camera, and social media. He has developed a computational tongue diagnosis method based on Traditional Chinese Medicine (TCM). In addition, he has worked on privacy algorithms in human imaging, digital human modeling, and game-based biomedical simulation.

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