As indicated in a famous adage “A picture is worth a thousand words”, images usually convey a lot of information. It is desirable to separate input images into multiple layers via image perception algorithms for people to understand them easily. In this talk, I will present our image perception works, which benefit outdoor vision systems, multimedia, and healthcare. First, I will present our innovative methods to address adverse weather image restoration for outdoor vision systems. Then, I will talk about our works on the multimedia era, which separate input photos into layers with textures, shadows, lanes, saliency, and so on. Lastly, I will also describe our AI-based healthcare algorithms.