

## Light-field Imaging: Capturing 3D in One Snapshot

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Imaging technology has completely transformed our understanding and perception of the world, with advancement in medical imaging and astronomical observations. Imaging devices and methods have paved the way for significant breakthroughs in a variety of fields. Whether it is detecting cancer at an early stage or capturing the beauty of distant galaxies, imaging has become an indispensable tool for researchers and practitioners alike. As we continue to push the boundaries of what is possible, the field of imaging is constantly evolving, leading to increasingly sophisticated devices and techniques. One such technique is light-field imaging, which captures all light rays passing through a certain point in space, allowing for the creation of a four-dimensional data set. Unlike traditional images, light fields include information about the scene in all dimensions, including vector representations of light direction and intensity over time. During this talk, I will introduce the latest advancements in light-field imaging and present a new method that uses color-encoding to convert viewing angles into specific colors. This microlens-free approach to light-field imaging and absolute spatial positioning has the potential to revolutionize various fields, including 3D phase-contrast imaging, robotics, autonomous navigation, and satellite navigation.