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Emerging theories and technologies on computational imaging

Key words: Computational imaging; Multi-scale and multi-dimensional; Super-resolution; Femto-photography; 3D reconstruction; Hyperspectral imaging

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Motivation

- To review the most recent advanced research work in the field of Computational imaging, from the different perspectives of the light signal: spatial, temporal, angular, spectral dimensions and phase.
- To conclude the research trend in the development of computational imaging.

Main Contents

We reviewed the advanced research work in the following five dimension of light signal:

- Spatial dimension
- Temporal dimension
- Angular dimension
- Spectral dimension
- Phase

Conclusions

- The future trend in computational imaging:
  - Interdisciplinary integration, over brain science, chemical, material, biomedical, etc., and cross-reinforcement strategy combining different imaging methods.
  - Multi-dimensional and multi-scale imaging
  - Imaging under extreme conditions such as ultra weak illumination, scattering media, deep in biology objects, etc.