## Future technologies for light manipulation: Metamaterials

## Kanamori & Okatani Lab. / Inomata Lab., Department of Robotics

By designing structures smaller than the light wavelength, we study artificial optical materials (metamaterials) that can artificially control the optical response of materials and aim to apply them to novel optical filters and sensors.

## **Development technologies**

By developing the design and fabrication technologies for artificial optical materials (metamaterials) based on sub-wavelength optics, useful functions and applied devices that can not be achieved with substances in nature were realized, such as antireflective surfaces (applied to high-brightness LED), high-efficient wavelength-selective filters (applied to color filters and spectroscopies), and filters that shift the resonant wavelength according to ambient refractive index changes (applied to biosensors).

## Spillover effect on industries

We aim at technologies to control light freely on demand. Parts of these technologies are put to practical use in display and optical lens products. In the future, application in the fields of information, energy, global environment, medical care and welfare can be highly expected.



Highly efficient optical filter and sensor applications using metamaterials