

## COMPUTER HOLOGRAPHY WORKSHOP

**Prof. Tomoyoshi Shimobaba**

Computer holography including computer-generated hologram and digital holography is promising technology for a novel 3D display, microminiaturized projector, 3D microscopy and so forth. In this lecture, I will talk about "Introduction to computer holography" with programming exercise. The following shows the lecture plan. The total time of the lecture is about 10 hours.

1. Introduction to computer holography (1 hour)
  - 1.1 Holography
  - 1.2 Diffraction calculation
  - 1.3 Applications of computer holography  
(Topic :3D display, projector, digital holography )
2. Programming Exercise with C++ or Python
  - 2.1 How to use computational wave optics library (1 hour)
  - 2.2 Calculation of computer-generated hologram (3 hours)
  - 2.3 Calculation of digital holography (2 hours)
  - 2.4 Phase retrieval algorithms (2 hour)
3. Hardware implementation of computer holography (1 hour)  
(Topic: GPU computing , FPGA computing)
4. Conclusion

Total lecture time : about 10 hours

Lecture co-financed by the European Union in scope of the European Social Fund