**课程1：**Introduction to Digital Image Processing

**开课时间：** 共10次课，July 27-31 and August 3-7，北京时间上午9点开始，每次课约1小时。

**线上教学方式：**Webex

**Course Description:**

Concepts and applications in image processing; introduction to multidimensional signal processing: sampling, Fourier transform, filtering, interpolation, and decimation; image enhancement and restoration; image analysis.

**10 lectures Schedule:**

1. Introduction and overview

2. Multidimensional signals

3. Two-dimensional Fourier transform

4. Two-dimensional Fourier transform properties and examples

5. Sampling and aliasing

6. Two-dimensional systems

7. Frequency response of two-dimensional systems

8. Applications: Point operations; image interpolation and decimation

9. Applications: Filtering (e.g., edge enhancement, noise reduction)

10. Applications: Remote sensing example; deconvolution

**Lecturer biography:**

Mark D. Butala received the H.B.E.E. degree in electrical engineering from the University of Delaware, Newark, DE, USA, in 2002, and the M.S. and Ph.D. degrees in electrical and computer engineering from the University of Illinois Urbana–Champaign (UIUC), IL, USA, in 2004 and 2010, respectively. From 2010 to 2015, he was a Member of the Technical Staff with the NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA.

From 2016 to 2017, he was a Visiting Research Scientist with the Department of Electrical and Computer Engineering, UIUC, where he studied power transmission system impacts of geomagnetically induced currents. Since 2017, he has been with the Faculty of Zhejiang University, Hangzhou, Zhejiang, China, where he is currently an Assistant Professor with the College of Information Science and Electronics Engineering, Zhejiang University–University of Illinois at Urbana–Champaign Institute, and also an Adjunct Assistant Professor with the Department of Electrical and Computer Engineering, UIUC. His research interests include remote sensing, image reconstruction and tomography, and statistical signal, and image processing theory and application.