

Introduction to AI and Inverse Problems

Time | 10:00-17:00, August 28, and 09:30-15:00, August 29, 2026

Venue | Red Building A311, Department of Applied Mathematics,
National University of Tainan

Speakers

Jenn-Nan Wang	National Taiwan University
Yueh-Cheng Kuo	National Chengchi University
Chern-Shuh Wang	National Cheng Kung University

Organizers

Yin-Liang Huang	National University of Tainan
Chern-Shuh Wang	National Cheng Kung University

Introduction & Purposes

Inverse problems are across a wide range of real-world applications, for instance, medical imaging, geophysics, materials science, and aerodynamic, etc. However, most real-world inverse problems are ill-posed which usually causes from various uncertainties. Because of the challenges, in this course, we provide an introduction to fundamental knowledge in solving inverse problems using artificial intelligence (AI). In practice, a typical inverse problem, Kalman filtering arising from target/signal tracking, is demonstrated theoretically with numerical experiment as well. Finally, in view of realization of scientific computing in AI era, we provide a brief summary of some basic skills in the randomized numerical linear algebra.

Couse Schedule

August 28

10:00~10:50 An Introduction to AI and Inverse Problems (by J.-N. Wang)
11:00~11:50 AI and Inverse Partial Differential Equation (I) (by J.-N. Wang)
12:00~14:00 Lunch Break
14:00~14:50 AI and Inverse Partial Differential Equation (II) (by J.-N. Wang)
14:50~15:10 Tea Break
15:10~16:00 An Introduction to Randomized Numerical Linear Algebra (I) (by C.-S. Wang)
16:10~17:00 An Introduction to Randomized Numerical Linear Algebra (II) (by C.-S. Wang)

August 29

09:30~10:20 An Introduction to Nonlinear Kalman Filter (by Y.-C. Kuo)
10:30~11:20 Kalman Filter for Target/Signal Tracking (I) (by Y.-C. Kuo)
11:30~12:20 Kalman Filter for Target/Signal Tracking (II) (by Y.-C. Kuo)
12:20~15:00 Lunch Break

Registration

