

# Autonomous Ocean Sensing Workshop

## [智能海洋]工作坊

### I. General Information 工作坊資訊

#### **Instructor 講師:**

Prof. Henrik Schmidt,

Dr. Michael R. Benjamin

Laboratory for Autonomous Marine Sensing Systems, Massachusetts Institute of Technology, MA, US

#### **Goal:**

Learn the infrastructure of Autonomous Ocean Sensing utilizing artificial intelligence, domain knowledge of Ocean science, and unmanned surface vehicle operation. The workshop includes lectures, tutorial and field testing of an autonomous surface vehicle system.

#### **Date/Time:**

■ May 20 – 24, 2017

■ 9:am~7 pm, three-hour lecture and six- hour supervised lab time

#### **Venue:**

■ Lecture and Lab: Room 127A, ESOE, NTU(Computer classroom of ESOE)

■ Field Test: Outdoor swimming pool of NTU

#### **Registration Information:**

Suitable for students, engineers, and scientist

Fee: NTD2000 (lunch box included)

Number of people: 15 people max., 2-3 people for one group

Deadline: April 30 (registration opens on March 30)

Bring the laptop with LINUX system or Macintosh laptop yourself

Registration address:

[https://docs.google.com/forms/d/e/1FAIpQLSeiShvIVu6lZFG1JtyWYBIKyGGv4IpiGmHgsiAh09I\\_5UX7aQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSeiShvIVu6lZFG1JtyWYBIKyGGv4IpiGmHgsiAh09I_5UX7aQ/viewform?usp=sf_link)

## Pre-requisite:

LINUX system or Macintosh laptop (will hold a pre-workshop class)

Programming: C++

Discipline: Dynamics, underwater acoustics, mechatronics (any one of those)

## II. Schedule:

	5/20	5/21	5/22	5/23	5/24
A. M	1. Opening 2. Introduction and marine robotics applications 3. Introduction to MOOS , 4. MOOS programming 5. Ocean acoustic environment	X	6. Introduction to Autonomy, Multi-Vehicle Autonomy and nested Autonomy 7. Acoustic Networking, Communications and Collaborative Search	8. Contact Behaviors, Dynamic Behavior, Spawning Writing Behaviors, and Parameter Estimation 9. Helm Optimization, Adaptive Acoustics and Mission Optimization	Field Test
Lunch time					
P.M	Supervised Laboratory	X	Supervised Laboratory	Supervised Laboratory	

**(Field test place: Outdoor swimming pool)**

### ● Outdoor swimming pool of NTU:



**Length:50m**

**Wide:22m**

**Depth:130~160cm**

### III. Organizer and Sponsor:

- **Organizer:**

- Department of Engineering Science and Ocean Engineering, National Taiwan University
- Ship and Ocean Technology Research Center, National Taiwan University

- **Sponsor:**

- Ministry of Science and Technology
- OceanSound Ltd. Co.

- **Organizing Committee**

- **Program:** Chi-Fang Chen, Chau-Hong Chen, Ruey-Yi Chang, Henrik Schmidt, Michael R. Benjamin
- **Registration:** Chi-Hong Chen, Mao-Hsiung Chiang
- **General Affairs:** Chun-Wu Wang
- **TA :** Ting-Jung Kuo, Yen-Hsiang Huang, and Jing-Tang Hung
- **Logistics:** Pichun Wu, Yi-Chun Chu and Ying-Jung Chen