

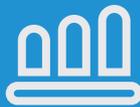


## JOINT INTERNATIONAL WORKSHOP ON

# InSAR TECHNOLOGIES

for Urban Infrastructural Health Diagnosis

城市基礎設施健康診斷的InSAR技術國際研討會



- Buildings
- Highways, railways, subways, and tunnels
- Bridges and dams
- Oil/gas pipelines
- Reclamation airports and the affiliated facilities



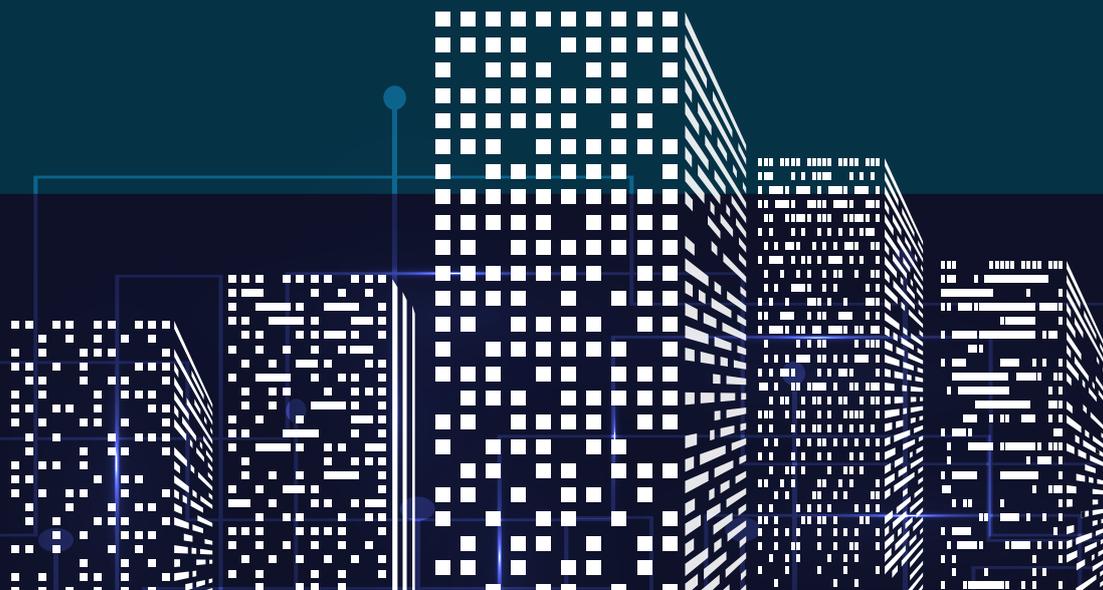
The Chinese  
University of  
Hong Kong



Tutorial:  
17 Jan 2017

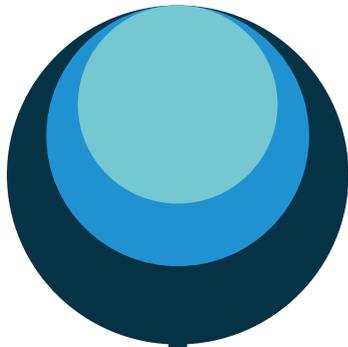
Workshop:  
18 - 19 Jan 2017

## Guidebook





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# Introduction

Global urbanization is creating huge demands for civil infrastructures, such as buildings, bridges, dams, tunnels, highways, airports, and railroads. Unfortunately, their maintenance management is usually not well coordinated. Under the progressive natural and/or human stressors, such as structural aging, sediment loading, groundwater or gas extraction, underground construction, or design faults civil infrastructures are deteriorating gradually, possibly resulting in catastrophic structural failure. In order to reduce deformation risks, there is an urgent need to address existing challenges and prepare for future ones by focusing on: monitoring, assessing and understanding deformation risks and sharing such information and how it is created.

In the last decades synthetic aperture radar interferometry (InSAR) has become an acknowledged geodetic technology. Its second-generation methods PSI, SqueeSAR, SBAS, tomography and variants thereof have revolutionized our understanding of a variety of geodynamic and structural phenomena (e.g., earthquakes, local subsidence, thermal and loading-induced building deformation) by mapping terrain movements and object deformation with unprecedented spatiotemporal details. Advances in very high resolution SAR satellite technology make it possible to remotely sense the minute deformation associated with the health states of individual structures over large areas, and provide a better picture of urban infrastructural dynamics for engineers. On the other hand the new Sentinel-1 line of SAR satellites provides us with data of unprecedented revisit frequency and long-term continuity on the basis of a free and open data policy. With all these observation capabilities in place and similar to human health diagnosis with an X-ray computed tomography (CT) scan, InSAR can be potentially used for urban infrastructural health diagnosis and early-warning of deformation risks.

This workshop, jointly organized by Institute of Space and Earth Information Science (ISEIS) of The Chinese University of Hong Kong (CUHK), the Remote Sensing Technology Institute (IMF) of the German Aerospace Center (DLR) and the Chinese Academy of Surveying and Mapping (CASM) will serve as an open forum to exchange ideas with latest developments in this area. The format of the event will include keynote speeches, submitted talks, and panel discussions.

## Organizer

Institute of Space and Earth Information Science, The Chinese University of Hong Kong  
German Aerospace Center (DLR)  
Chinese Academy of Surveying & Mapping (CASM)

## Sponsors

Hong Du (International) Development Company Limited

# Conference Information

## Location

### Conference Venue

- Room 303, Fok Ying Tung Remote Sensing Science Building, The Chinese University of Hong Kong

### Lunches

- Canteen, New Asia College

### Dinner

- Serenade Chinese Restaurant, 2/F, Hong Kong Cultural Centre, 10 Salisbury Road, Tsim Sha Tsui

## Name Badge

Please wear the conference name badges for identification during the conference period.

## Smoking

Smoking is **strictly forbidden** in the whole CUHK campus.

## Mobile Phone

As a courtesy to other participants and presenters, please ensure that all mobile device(s) is/are turned off or is/are in **“SILENT”** mode during the sessions.

## Enquiries

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Email: mapeifeng@cuhk.edu.hk

### Ms. Chloris Yip

Email: chlorisyip@cuhk.edu.hk

# Speakers

## Keynote Speakers:

### Prof. Richard Bamler

German Aerospace Center (DLR)

Speech Title 1: *SAR Interferometry*

Speech Title 2: *Recent Advances in Spaceborne SAR Interferometry at DLR*



### Prof. Renzhong Guo

Urban Planning, Land & Resource Commission of Shenzhen Municipality

Speech Title 1: *Systematic Thinking and Technological Path of Megacity  
Public Security*



### Mr. Nico Adam

German Aerospace Center (DLR)

Speech Title 1: *German Ground Motion Map*



### Prof. Thomas Lege

Bundesanstalt für Geowissenschaften und Rohstoffe (BGR)

Speech Title 1: *German Ground Motion Map*



### Dr. Alessandro Ferretti

TRE ALTAMIRA

Speech Title 1: *Introduction into SAR Interferometry and Persistent  
Scatterer InSAR*



# Speakers

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## Prof. Ramon Hanssen

Technical University of Delft

Speech Title 1: *Infrastructure Monitoring Using InSAR Is More Than Colored Dots*



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## Prof. Fabrizio Lombardini

University of Pisa

Speech Title 1: *Advanced Deformation Monitoring: Spaceborne Multidimensional SAR Imaging and Ground-based Interferometry*



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## Prof. Mingsheng Liao

Wuhan University

Speech Title 1: *Monitoring Structure Health of Different Types of Bridges with Advanced Multi-temporal InSAR Imagery*



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## Dr. Mario Costantini

e-GEOS

Speech Title 1: *PSP SAR Interferometry for Building and Infrastructure Monitoring: Results with COSMO-SkyMed Data, and Analysis of Potentials and Limitations of Different Satellite SAR Missions*



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## Prof. Xiaoli Ding

The Hong Kong Polytechnic University

Speech Title 1: *Monitoring Mega Bridges with Ground Based Radar System*



# Programme

## Tutorial

### 17 January 2017 (Tuesday)

Venue: Room 303, Fok Ying Tung Remote Sensing Science Building, The Chinese University of Hong Kong

9:00-9:15 Registration

#### Opening Remarks and Group Photo Taking

9:30-11:00 T1: SAR Interferometry  
by Prof. Richard Bamler, DLR

11:00-11:20 Tea Break

11:20-12:50 T1: SAR Interferometry  
by Prof. Richard Bamler, DLR

12:50-14:15 Lunch  
(Restaurant: Staff Canteen of New Asia College, The Chinese University of Hong Kong)

14:15-15:15 T1: SAR Interferometry  
by Prof. Richard Bamler, DLR

15:15-15:35 Tea Break

15:35-16:50 T2: Introduction into SAR Interferometry and Persistent Scatterer InSAR  
by Dr. Alessandro Ferretti, TRE ALTAMIRA

16:50-17:10 Tea Break

17:10-18:25 T2: Introduction into SAR Interferometry and Persistent Scatterer InSAR  
by Dr. Alessandro Ferretti, TRE ALTAMIRA

## Workshop

### Day 1: 18 January 2017 (Wednesday)

Venue: Room 303, Fok Ying Tung Remote Sensing Science Building, The Chinese University of Hong Kong

9:00-9:15 Registration

9:15-9:40 Opening Ceremony and Group Photo Taking

#### Keynote Speech Session (Chair: Prof. Hui Lin)

9:40-10:20 Keynote Speech 1  
Systematic Thinking and Technological Path of Megacity Public Security  
by Prof. Renzhong Guo, Urban Planning, Land & Resource Commission of Shenzhen Municipality

10:20-11:00 Keynote Speech 2  
Recent Advances in Spaceborne SAR Interferometry at DLR  
by Prof. Richard Bamler, DLR

# Programme

11:00-11:20	Tea Break
11:20-12:00	Keynote Speech 3 German Ground Motion Map by Mr. Nico Adam, DLR and Prof. Thomas Lege, BGR
12:00-12:40	Keynote Speech 4 Monitoring Mega Bridges with Ground Based Radar System by Prof. Xiaoli Ding, The Hong Kong Polytechnic University
12:40-14:20	Lunch (Restaurant: Staff Canteen of New Asia College, The Chinese University of Hong Kong)
<b>Invited Oral Session (Chair: Prof. Fulong Chen)</b>	
14:20-14:40	Applications of the MetaSensing's FastGBSAR for Vibration and Deformation Monitoring by Adriano Meta, Metasensing BV
14:40-15:00	Structure Health Monitoring for Urban Infrastructures with TerraSAR-X Images by Xiaoqiong Qin, Wuhan University
15:00-15:20	Height Extraction and Deformation Monitoring of Lupu Bridge in Shanghai by Jingwen Zhao, Tongji University
15:20-15:40	Risk Monitoring and Sustainable Conservation of Heritage Sites by MT-InSAR Tools by Fulong Chen, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences
15:40-16:00	Tea Break
16:00-17:30	Panel Discussion (Panalists: Prof. Richard Bamler, Mr. Nico Adam, Prof. Thomas Lege, Dr. Alessandro Ferretti, Prof. Xiaoli Ding)
18:00-20:30	Welcome Dinner and Victoria Harbour Tour (Restaurant: Serenade Chinese Restaurant, 2/F, Hong Kong Cultural Centre, 10 Salisbury Road, Tsim Sha Tsui)

## Day 2: 19 January 2017 (Thursday)

Venue: Room 303, Fok Ying Tung Remote Sensing Science Building, The Chinese University of Hong Kong

### Keynote Speech Session (Chair: Prof. Mingsheng Liao)

9:00-9:40	Keynote Speech 5 Infrastructure Monitoring Using InSAR Is More Than Colored Dots by Prof. Ramon Hanssen, TU Delft
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# Programme

9:40-10:20	<b>Keynote Speech 6</b> <b>Advanced Deformation Monitoring: Spaceborne Multidimensional SAR Imaging and Ground-based Interferometry</b> by Prof. Fabrizio Lombardini, University of Pisa
10:20-10:40	<b>Tea Break</b>
10:40-11:20	<b>Keynote Speech 7</b> <b>PSP SAR Interferometry for Building and Infrastructure Monitoring: Results with COSMO-SkyMed Data, and Analysis of Potentials and Limitations of Different Satellite SAR Missions</b> by Dr. Mario Costantini, e-GEOS
11:20-12:00	<b>Keynote Speech 8</b> <b>Monitoring Structure Health of Different Types of Bridges with Advanced Multi-temporal InSAR Imagery</b> by Prof. Mingsheng Liao, Wuhan University
12:00-14:00	<b>Lunch</b> (Restaurant: Staff Canteen of New Asia College, The Chinese University of Hong Kong)
<b>Invited Oral Session (Chair: Dr. Peifeng Ma)</b>	
14:00-14:20	<b>Fast and Robust DS-InSAR Analysis of Reclamation Subsidence in Coastal Areas of China</b> by Liming Jiang, Institute of Geodesy and Geophysics, Chinese Academy of Sciences
14:20-14:40	<b>Ground Deformation Monitoring on Changing Landscapes by Temporarily Coherent Point InSAR</b> by Lei Zhang, The Hong Kong Polytechnic University
14:40-15:00	<b>InSAR Deformation Monitoring Technique Based on COSMO-SkyMed Data: Application to Security Assessment on Bridges</b> by Mao Zhu, Beijing Vastitude Technology Co. Ltd
15:00-15:20	<b>Three-pass D-InSAR Processing using TerraSAR-X / TanDEM-X Monostatic Pursuit Data – A Case Study in Shanghai</b> by Ziyun Wang, Wuhan University
15:20-15:40	<b>The Role of Thermal Expansion in The Monitoring of Urban Infrastructure</b> by Peifeng Ma, The Chinese University of Hong Kong
15:40-16:00	<b>Tea Break</b>
16:00-17:30	<b>Panel Discussion</b> (Panalists: Prof. Ramon Hanssen, Prof. Fabrizio Lombardini, Dr. Mario Costantini and Prof. Mingsheng Liao)
17:30-17:45	<b>Closing Remarks</b> (Chair: Prof. Hui Lin)

# Shuttle Bus

## Workshop Shuttle Bus

The following shuttle bus is provided for the workshop. Here is the schedule:

<b>17 January 2017 (Tuesday)</b>				
From	To	Departure Time*	Assembly Point	Contact Person
Royal Park Hotel	Fok Ying Tung Remote Sensing Science Building	8:30am	Main Lobby of Royal Park Hotel	Ms. Yuzhou Liu (Tel: 5136 5042)
Fok Ying Tung Remote Sensing Science Building	Royal Park Hotel	After Program	Outside Fok Ying Tung Remote Sensing Science Building	Mr. Guoqiang Shi (Tel: 6359 4650)

<b>18 January 2017 (Wednesday)</b>				
From	To	Departure Time*	Assembly Point	Contact Person
Royal Park Hotel	Fok Ying Tung Remote Sensing Science Building	8:30am	Main Lobby of Royal Park Hotel	Ms. Yuzhou Liu (Tel: 5136 5042)
Fok Ying Tung Remote Sensing Science Building	Serenade Chinese Restaurant	After Program	Outside Fok Ying Tung Remote Sensing Science Building	
Serenade Chinese Restaurant	Royal Park Hotel	After Tour	Outside Hong Kong Cultural Centre	

<b>19 January 2017 (Thursday)</b>				
From	To	Departure Time*	Assembly Point	Contact Person
Royal Park Hotel	Fok Ying Tung Remote Sensing Science Building	8:30am	Main Lobby of Royal Park Hotel	Ms. Yuzhou Liu (Tel: 5136 5042)
Fok Ying Tung Remote Sensing Science Building	Royal Park Hotel	After Program	Outside Fok Ying Tung Remote Sensing Science Building	Mr. Guoqiang Shi (Tel: 6359 4650)

\* The Shuttle bus will depart punctually. Please arrive the assembly point 5 minutes before the departure time.

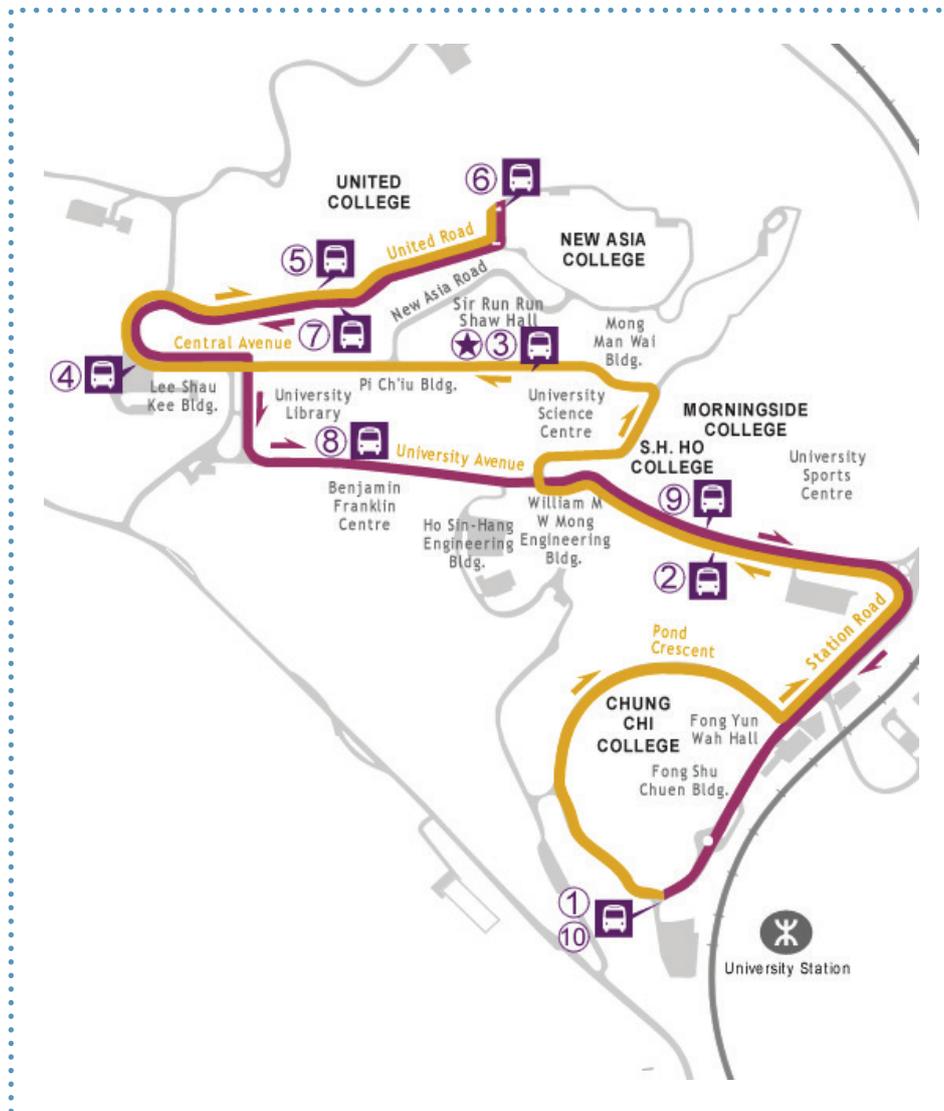
# Shuttle Bus

## CUHK Shuttle Bus Route No.2

If you will go to the workshop venue from university MTR station, you can take CUHK shuttle bus as follows:

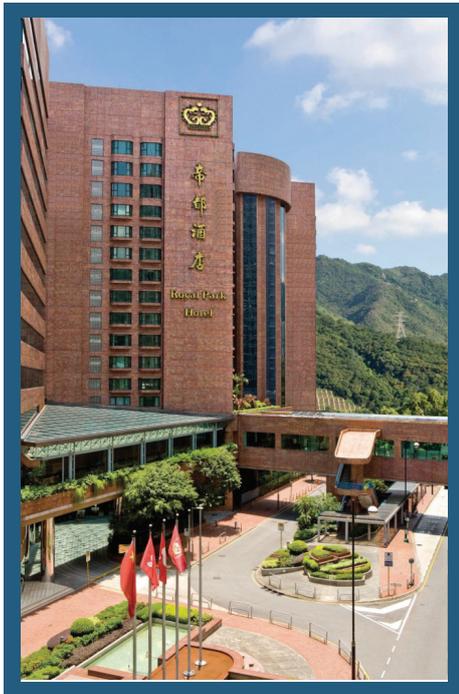
From	To	Period of Operation	Departure Time
Entrance Piazza	New Asia College	7:45am - 6:45pm	Every 00 , 15, 30 , 45

**\*\* Free shuttle bus service is available within the campus.**



# Designated Hotels

## Royal Park Hotel 帝都酒店



**8 Pak Hok Ting Street, Shatin, Hong Kong**  
香港沙田白鶴汀街八號

Tel: +852 2601 2111

Fax: +852 2601 3666

Website:

<http://www.royalpark.com.hk>

Royal Park Hotel is well-connected with public transport. Guests can walk between Shatin MTR station and Royal Park Hotel:



# More about Hong Kong

## Area

Hong Kong can be divided into four distinct parts:

- Hong Kong Island
- Kowloon Peninsula
- New Territories
- The Outlying Islands

## Map of Hong Kong



## Transportation in Hong Kong

Variety of public transportations can be found in Hong Kong. MTR Subway and bus are examples of the most popular public transportations in Hong Kong.

# More about Hong Kong

## Time Difference

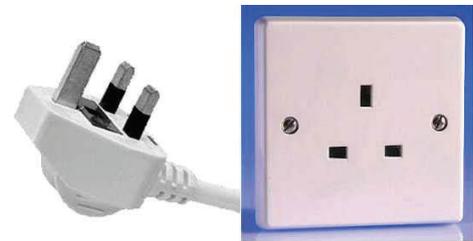
GMT/UTC + 8 hours

## Local Language

Hong Kong's official languages are Chinese and English. In hotels, major restaurants, stores, and tourist centers, most people speak English and Mandarin. This is not always the case, however, with taxi drivers, bus drivers, and workers in small shops, cafes, and market stalls, people just say native Cantonese.

## Electricity

220 volts, 50 cycles. Three-rectangular pin plugs are the norm.



## Currency & Currency Exchange

The Hong Kong dollar (HK\$) is the official currency. It is pegged to the US dollar at HK\$7.8 to US\$1.00 and is freely convertible. Traveler's checks are honored at most banks, hotels and shops.

Major credit cards are also widely accepted and ATM (ETC) facilities are widespread.



# More about Hong Kong

## Useful Telephone Numbers

Emergency Telephone - Police / Fire / Ambulance: .....	+852 999
Citizen's Easy Link: .....	+852 1823
Directory Inquiries: .....	+852 1083 (Chinese) +852 1081 (English)
Dial-a-Weather Service: .....	+852 1878 2000
Kowloon Bus (KMB): .....	+852 2745 4466
City Bus: .....	+852 2873 0818
First Bus: .....	+852 2136 8888
MTR Corporation Limited: .....	+852 2881 8888 +852 2947 7888
Taxi: .....	+852 2383 0168 +852 2476 2265 +852 2476 4247 +852 2475 0417 +852 2657 2267 +852 2450 2288 +852 2478 8332 +852 2332 2571 +852 2574 7311 +852 2760 0455 +852 2368 1318 +852 2362 2337
Hong Kong International Airport: .....	+852 21818888 (Chinese) +852 2181 0000 (English)







## Enquiries

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