



**Society of  
FLOATING SOLUTIONS  
(Singapore)**

## WCFS2019: SINGAPORE

World Conference on Floating Solutions, 22-23 April 2019

Venue: Faculty of Engineering, National University of Singapore, Singapore

### INTRODUCTION

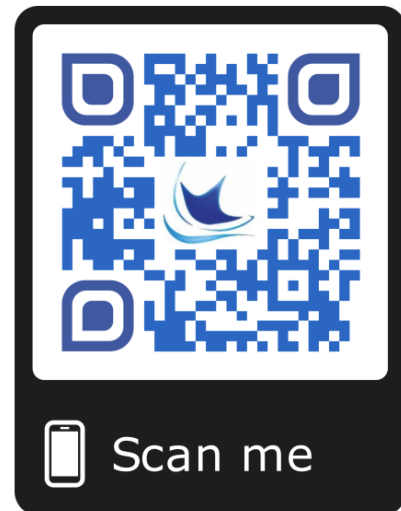
Singapore, once a third world country under British rule, is today the most expensive city in the world according to a 2018 EIU survey. It has achieved striking success in its land reclamation projects to support its urban and economic growth. 25% of its original 578 sq. km footprint has been reclaimed from the sea. Despite this, in the same time period, its population grew by 380%, creating an urban environment that makes it the world's densest country.

In 2013, a White Paper was released by the government essentially preparing this island nation for further population growth that would see it grow from the current 5.7 million to 6.9 million by 2030. The Ministry of National Development projected that Singapore would need to find space amounting to 56 sq km. However, land reclamation has become more challenging year by year, as sand mining is now seen to be ecologically damaging and banned by countries that had traditionally supplied sand to Singapore. Fortunately, it has about 700 sq km of territorial waters well sheltered by a cluster of Indonesian islands to the south. A 65-million TEU capacity mega port is being constructed which will see all port activities on the waterfront of downtown Singapore being diverted to the west.

We believe this opens up huge opportunities for creation of sea space floating solutions for the future. A group of multi-disciplinary professionals with this vision has come together to form the Society of FLOATING SOLUTIONS Singapore (SFSS).

In January 2018, the Society invited Professor Jacopo Buongiorno of the Massachusetts Institute of Technology to speak at the National University of Singapore. He delivered a talk suggesting that to meet Singapore's energy resilience needs and in view of the limited land area, a floating nuclear plant could be considered. We also had other speakers sharing other floating solutions with us on 1 March 2018. Dr. Øyvind Hellan and Dr Arnstein Watn of SINTEF Norway and Dr Masaki Takeuchi of Shimizu Japan spoke at our conference on titled "The Application and technology of Floating Structures" at the Singapore Institute of Technology. In August 2018, the Society organised a one-day seminar on floating farms for a sustainable future. The seminar speakers include Mr Peter van Wingerden (CEO and founder of Belandon) who gave a talk on farming on water, Mr Leow Ban Tat (Founder and Managing Director of AME2) who spoke on floating fish farms, Dr Shinjo Sato (Nihon University) who spoke on floating composite plant factory, Mr Morten Lund Hoffman (Multiconsult Asia Pte Ltd) who gave a talk on floating structures in Norway and Mr Gary Wong (Keppel Offshore and Marine) who spoke on repurposing offshore technology to unlock the potentials of sea space

Continuing on this journey, the Society is organizing a World Conference on Floating Solutions with a view of elevating international awareness of the benefits of floating structures.



QR Code for Registration  
or use this link  
<https://tinyurl.com/WCFS2019>

**Organiser**  
Society of FLOATING  
SOLUTIONS (Singapore)

**When**  
Mon 22nd - Tue 23rd  
Apr 2019

**Where**  
Engineering Auditorium,  
Faculty of Engineering  
National University of  
Singapore  
Kent Ridge, Singapore

**Contact**  
C.M. Wang, Chairman  
[cm.wang@uq.edu.au](mailto:cm.wang@uq.edu.au)



## MISSION OF SOCIETY OF FLOATING SOLUTIONS SINGAPORE

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The mission of the Society is to facilitate the application of scientific principles and proven offshore technologies to the design, engineering and construction of floating space solutions to enhance the quality of human life, address issues of land scarcity, harvest offshore renewable energy, increase food and water production, overcome the problem of rising sea level due to global warming in ways that are eco-friendly and sustainable.

## WHO SHOULD ATTEND THIS CONFERENCE?

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This conference is organized for architects, city planners, maritime policy makers, practicing engineers, naval architects, contractors, academics, researchers and other construction professionals who are involved and wish to upgrade their knowledge on the analysis, design and construction of floating structures in their course of work. Students are particularly welcomed.

## REGISTRATION

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The registration fee is inclusive of a copy of Conference Proceedings (in colour), coffee breaks, lunches and admission to the lectures.

For SFSS members: 300 SGD before 1 February 2019 to enjoy early bird registration  
350 SGD after 1 February 2019

For non-SFSS members: 400 SGD before 1 February 2019 to enjoy early bird registration  
450 SGD after 1 February 2019

For full-time students: 200 SGD

In order to register for the conference, please visit this link:  
<https://tinyurl.com/WCFS2019>

Interested participants should register & complete payment online not later than 15 April 2019

## KEY DATES

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Deadline for submission of full papers: 15 December 2018

Deadline for early bird registration: 1 February 2019

Deadline for registration: 15 April 2019

Conference Dates: 22-23 April 2019





## SPEAKERS FOR DAY 1

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**Mr Koen Olthuis**  
Founder and Principal Architect  
Waterstudio.NL, The Netherlands



**Mr Soon Heng Lim**  
President of the Society of  
FLOATING SOLUTIONS (Singapore)



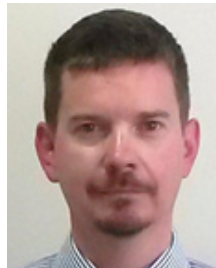
**Prof Torgeir Moan**  
Emeritus Professor  
Marine Technology, NTNU, Norway



**Dr Toshio Nakajima**  
President  
Waterfront Real Estate Co. Ltd.



**Prof Joseph Ee Man Lim**  
Professor  
National University of Singapore



**Dr Cliff Ohl**  
Principal Maritime Engineer  
Royal HaskoningDHV



**Mr Adrian Arnold**  
Technical Director  
Royal HaskoningDHV



**Prof Daolin Xu**  
Professor  
Hunan University, China



**Mr Yves De Leeneer**  
Managing Director  
DEEPBLUE Pte Ltd



**Mr Aditya Sankalp**  
Technical Manager  
DEEPBLUE Pte Ltd



**Dr Narasimalu Srikanth**  
Program Director and Senior Scientist  
ERI, Nanyang Technological University,  
Singapore



**Prof Tomoaki Utsunomiya**  
Professor  
Kyushu University, Japan

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## SPEAKERS FOR DAY 2

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**Dr Kok Keng Ang**  
Associate Professor  
National University of Singapore



**Mr Tor Ole Olsen**  
Dr Techn. Olav Olsen  
Norway



**Mr Chien Looi Wang**  
Deputy Director of Infrastructure and  
Development Research  
Building Research Institute, Housing  
Development Board, Singapore



**Dr Sabet Divsholi Bahador**  
Managing Director  
Global Engineering Creators Pt Ltd.



**Dr Kwanghoe Jung**  
General Manager and Chief Structural  
Engineer,  
Hyundai Engineering and Construction



**Mr William Otto**  
Senior Project Manager  
MARIN



**Mr Chi Zhang**  
PhD Candidate  
National University of Singapore



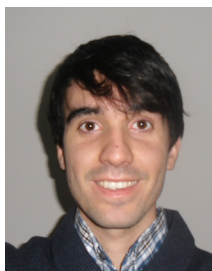
**Mr Chun Wei Ng**  
Senior Engineer  
DNV GL Approval Centre, Singapore



**Prof Chien Ming Wang**  
TMR Chair Professor in  
Structural Engineering  
The University of Queensland



**Mr David Carrascosa Francis**  
Chief Technology Officer  
Saitec Offshore Technologies, S.L.



**Mr Rui L. P. de Lima**  
INDYMO, The Netherlands

You may view the brief resumes of all speakers and their paper abstracts at the conference website:

<http://wcfs2019.floatingsolutions.org/>

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## ORGANISING COMMITTEE

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Chairman:	Prof Chien Ming Wang	cm.wang@uq.edu.au
Co-Chairman:	Dr Sabet Divsholi Bahador	bsabet@creatprs-global.com
Advisor:	Mr Soon Heng Lim	lsh@sixtrees.com.sg
Secretary:	Mr Charles Lim	milselrahc@gmail.com
Treasurer:	Mr Anil Thapar	anil.thapar@bmtglobal.com
Technical Program:	Dr Zhi Yung Tay	zhiyung.tay@singaporetech.edu.sg
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	Captain James Fong	jamesfong@gmaritime.com
	Mr Roland Tan	ps654rt@gmail.com
	Mr Ivan Stoytchev	ivan.s.stoytchev@gmail.com
	Mr Dave Kinrade	dkinrade@singnet.com.sg

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## SUPPORTERS OF CONFERENCE

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The *Institution*  
of *Structural*  
*Engineers*



Enterprise  
Singapore





### PAPERS THAT WILL BE PRESENTED AT CONFERENCE

**Design guidelines for upgrading living conditions in wetlands**

Koen Olthuis (Waterstudio.NL Architecture)

**Seascape the landscape in Singapore: A disruptive solution for space creation**

Soon Heng Lim (President of SFSS)

**Floating bridges and submerged tunnels in Norway - history and future outlook**

Torgeir Moan (Norwegian University of Science and Technology)

**An integrated floating community based upon a hybrid water system: Toward a super sustainable water city**

Toshio Nakajima (Waterfront Real Estate), Motohiko Umeyama (Tokyo Metropolitan University)

**Repurposing jack-ups, semi-submersibles and super-barges into offshore and nearshore settlements**

Joseph Lim (National University of Singapore)

**Floating shipyard design concept and application**

Cliff Ohl and Adrian Arnold (Royal Haskoning DHV)

**Dynamics of super-scale modularized floating airport**

Haicheng Zhang, Daolin Xu, Shuyan Xia, Qijia Shi, and Rui Ding (Hunan University)

**Mooring systems for very large floating structures**

Aditya Sankalp and Yves De Leeneer (DEEPBLUE)

**Floating clean multi-energy systems towards driving blue economic growth**

Narasimalu Srikanth (Energy Research Institute, Nanyang Technological University)

**Floating offshore wind turbines in Goto Islands, Nagasaki, Japan**

Tomoaki Utsunomiya (Kyushu University, Japan), Iku Sato (Toda Corporation) and Takashi Shiraishi (Hitachi)

**Design and potential applications of floating structures in Singapore**

Kok Keng Ang (National University of Singapore), Dai Jian, Oyvind Hellan, Arnstein Watn and James Lee

**Fish farming in floating structures**

Tor Ole Olsen (Dr.techn.OlavOlsen AS, Norway)

**Driving innovations in support of greenery, biodiversity and clean energy initiatives in Singapore**

Johnny Liang Heng Wong (Building & Research Institute, HDB, Singapore), Sze Tiong Tan, Chien Looi Wang, Han Vincent Lim, Kok Keng Ang, Jian Dai

**Floating concrete platforms**

Sabet Divsholi Bahador (eCreators-global)

**Design and construction of concrete floating pier in Golden Harbor, Incheon**

Kwanghoe Jung (Hyundai Engineering and Construction), S.H. Lee, H.S. Kim, Y.H. Choi and S. Kang

**Wave induced motions of floating mega island**

William Otto (MARIN)

**Hydrodynamic responses and loads of a model floating hydrocarbon storage tank system for concept validation and numerical verification**

Chi Zhang (National University of Singapore), Allan R. Magee, Nuno Fonseca, Nianxin Ren, Miguel Rodrigues, Øyvind Hellan, and Kok Keng Ang

**Classification principles for very large floating structures**

Chun Wee Ng and Rongrong Jiang (DNV GL)

**Floating forest: a novel floating breakwater-windbreak structure**

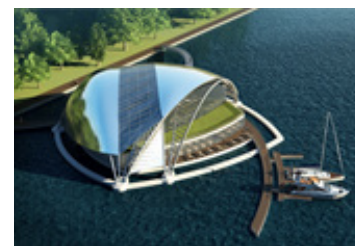
Chien Ming Wang (The University of Queensland), Mengmeng Han and Junwei Lyu

**DemoSATH Project - Demonstrating technical feasibility of disruptive concrete floating offshore wind solution**

David Carrascosa Francis (Saitec Offshore Technologies)

**Influence of floating housing on water quality and ecology in The Netherlands**

Rui L.P. de Lima (INDYMO), Rutger E. de Graaf-van Dinther, Floris C. Boogaard, Janko Lenz and Hannah Hartwich





## CONFERENCE PROGRAMME - DAY 1 (MONDAY 22 APRIL 2019)

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- 0800hrs Registration @ Foyer of Engineering Auditorium, National University of Singapore
- Session 1 Chairman: Dr Sabet Divsholi Bahador**
- 0900hrs Welcome Address  
by Prof C.M. Wang (Vice-President of SFSS)
- 0910hrs Design guidelines for upgrading living conditions in wetlands  
by K. Olthuis (Waterstudio.NL Architecture)
- 0940hrs Seascape the landscape in Singapore: A disruptive solution for space creation  
by Mr S. H. Lim, President of Society of Floating Solutions Singapore
- 1010hrs Morning Tea/Coffee Break @ Foyer of Engineering Auditorium
- Session 2 Chairman: Dr Paul Ong**
- 1040hrs Floating bridges and submerged tunnels in Norway - the history and future outlook  
by Prof T. Moan (Norwegian University of Science and Technology)
- 1110hrs An integrated floating community based upon a hybrid water system: toward a super-sustainable water city  
by Dr T. Nakajima (Waterfront Real Estate) & Prof M. Umeyama (Tokyo Metropolitan University)
- 1140hrs Repurposing jack-ups, semi-submersibles and super-barges into offshore and nearshore settlements  
by Prof Joseph Lim (National University of Singapore)
- 1210hrs Lunch @ Foyer of Engineering Auditorium
- Session 3 Chairman: Dr Zhi Yung Tay**
- 1330hrs Floating shipyard design concept and application  
by Cliff Ohl and Adrian Arnold (Royal HaskoningDHV)
- 1400hrs Dynamics of super-scale modularized floating airport  
by Prof Daolin Xu (Hunan University, China)
- 1430hrs Mooring systems for very large floating structures  
by Aditya Sankalp and Yves De Leeneer (DEEPBLUE Pte Ltd)
- 1500hrs Afternoon Tea/Coffee Break @ Foyer of Engineering Auditorium
- Session 4 Chairman: Dr Anil Thapar**
- 1530hrs Floating clean multi-energy systems towards driving blue economic growth  
by Narasimalu Srikanth (Energy Research Institute, Nanyang Technological University)
- 1600hrs Floating offshore wind turbines in Goto Islands, Nagasaki, Japan  
by Prof T. Utsunomiya (Kyushu University, Japan)
- 1630hrs Design and potential applications of floating structures in Singapore  
by A/Prof K.K. Ang (National University of Singapore)
- 1700hrs Day 1 Programme Ends



## CONFERENCE PROGRAMME - DAY 2 (TUESDAY 23 APRIL 2019)

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- 0830hrs Registration @ Foyer of Engineering Auditorium, National University of Singapore
- Session 5 Chairman: Mr. Charles Lim**
- 0900hrs Fish Farming in Floating Structures  
by Mr T.O. Olsen (Dr.techn.OlavOlsen AS, Norway)
- 0930hrs Driving innovations in support of greenery, biodiversity and clean energy initiatives in Singapore  
by Mr. C.L. Wang (Building & Research Institute, HDB, Singapore)
- 1000hrs Morning Tea/Coffee Break @ Foyer of Engineering Auditorium
- Session 6 Chairman: Captain James Fong**
- 1030hrs Floating concrete platforms  
by Dr Sabet Divsholi Bahador (eCreators-global)
- 1100hrs Design and construction of concrete floating pier in Golden Harbor, Incheon  
by Dr K.H. Jung (Hyundai Engineering and Construction)
- 1130hrs Wave induced motions of floating mega island  
by Mr W. Otto (MARIN)
- 1200hrs Lunch @ Foyer of Engineering Auditorium
- Session 7 Chairman: Mr. Ivan Stoytchev**
- 1330hrs Hydrodynamic responses and loads of a model floating hydrocarbon storage tank system for concept validation and numerical verification  
by Chi Zhang (National University of Singapore)
- 1400hrs Classification principles for very large floating structures  
by Chua Wee Ng (DNV GL)
- 1430hrs Floating forest  
by Prof C.M. Wang (The University of Queensland)
- 1500hrs Afternoon Tea/Coffee Break @ Foyer of Engineering Auditorium
- Session 8 Chairman: Mr. Dave Kinrade**
- 1530hrs DemoSATH Project - Demonstrating the technical feasibility of a disruptive concrete floating offshore wind solution  
by Mr David Carrascosa Francis (Saitec Offshore Technologies, S.L.)
- 1600hrs Influence of floating housing on water quality and ecology in The Netherlands  
by Rui L. P. de Lima (INDYMO)
- 1630hrs Closing Remarks by SFSS President Mr S.H. Lim
- 1645hrs End of Conference Programme



12 PDUs  
to be confirmed