

**Name:** Dr. Mimi GAO  
**Date of Birth:** 06 Mar 1980  
**Nationality:** Singaporean  
**Country of Residence:** Singapore  
**Language(s): Spoken** English, Chinese  
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**Profession:** Forensic Naval Architect,  
Expert witness, Arbitrator



#### Academic & Professional Qualification(s):

- **PhD** - Computational Fluid Dynamics, National University of Singapore
- **BEng** - Naval Architecture & Ocean Engineering, Shanghai Jiao Tong University
- Chartered Engineer (**CEng**) - Engineering Council UK

#### Professional Membership(s):

- **Fellow**, Singapore Institute of Arbitrators (**FSI Arb**)
- **Panel Arbitrator**, Singapore Chamber of Maritime Arbitration (**SCMA**)
- **Supporting Member**, London Maritime Arbitrators Association (**LMAA**)
- **Member**, Royal Institution of Naval Architects (**RINA**)
- **Member**, Maritime Law Association of Singapore (**MLAS**)
- **Member**, Women's International Shipping & Trading Association (**WISTA**)

#### Career & Professional Experience:

##### **SEA & GAO PTE. LTD. | Singapore**

##### **Managing Director / Forensic Naval Architect / Arbitrator | 2022 – Present**

- Direct a premier maritime consultancy providing specialized technical forensic analysis, expert witness testimony, and alternative dispute resolution (ADR) services globally.
- Appointed as **Expert Witness and Expert Determiner** across high-value maritime disputes, providing authoritative engineering analysis for litigations involving:
  - *Structural & Infrastructure Damages:* Jetty fenders, subsea/onshore cables (fatigue analysis), FPSO mooring chain failures, and docking/berthing incidents.
  - *Casualties & Mechanical Failures:* Collisions, towing incidents, marine loading arm failures, and offshore wind turbine structural damage.
  - *Design & Performance Disputes:* Propeller damage claims, CFD analysis of energy-saving devices, and multi-million-dollar LNG ship design disputes.
- Serve as a **Panel Arbitrator** in complex maritime arbitrations under both institutional and ad-hoc rules.

##### **BRAEMAR (now ABL Group) | Singapore**

##### **Principal Naval Architect / Expert Witness | 2018 – 2022**

- Led technical forensic investigations and insurance marine surveys for a global maritime consultancy.

- Delivered expert opinions relied upon in international tribunals across **London (LMAA), New Zealand, and Hong Kong (HKIAC)**.
- Conducted rigorous technical evaluations on:
  - *Design & Mechanical Deficiencies*: Wind farm installation vessel design disputes, stern tube/intermediate bearing failures, and reduction gear box fatigue using Finite Element Method (FEM).
  - *Operational Failures*: Offshore mooring system collapses (FPSO, FPU, CALM buoys), cargo lashing/toppling incidents, and commercial speed/fuel oil consumption disputes.
- Managed physical forensic inspections and metallurgical testing (e.g., with TÜV SÜD labs).

#### **BROOKES BELL LLP | Singapore**

##### **Naval Architect / Expert Witness | 2015 – 2018**

- Provided technical expertise to shipowners, charterers, P&I Clubs, and legal firms on high-stakes marine casualties and performance disputes under **LMAA** jurisdiction.
- Attended critical physical testing programs, including new-built sea trials and shaft power measurements across major shipyards in **Japan, China, and South Korea**.
- Evaluated propeller modifications, ship propulsion disputes, mooring designs, and ship model testing at premier global institutes like **MARIN**.
- Investigated complex hydrodynamic phenomena, including propeller noise/vibration issues for commercial vessels in Hong Kong.

#### **LLOYD'S REGISTER GLOBAL TECHNOLOGY CENTRE | Singapore**

##### **Specialist / Naval Architect | 2014 – 2015**

- Spearheaded cutting-edge research and regulatory compliance frameworks for a world-leading classification society.
- Formulated technical safety guidelines regarding extreme wave impacts under **LR Rules**.
- Led advanced CFD modelling for pioneering clean energy projects, including wave energy harvesting devices and offshore wind turbines.
- Supported a Joint Industry Project (JIP) with **A\*STAR** on Singapore Deepwater basin development.
- Mentored and supervised PhD candidates in advanced naval architectural research.

#### **NATIONAL UNIVERSITY OF SINGAPORE (NUS) | Singapore**

##### **Postdoctoral Research Fellow / Research Engineer | 2009 – 2014**

- Developed proprietary Computational Fluid Dynamics (CFD) codes for advanced maritime application.
- Conducted breakthrough numerical studies on Tsunami impact dynamics on coastal infrastructures.
- Led a high-profile research initiative investigating sloshing dynamics on membrane-type LNG vessels, combining experimental lab work with numerical simulations.
- Executed complex Finite Element Method (FEM) analysis for urban structural engineering projects in Singapore.

#### **INTERNATIONAL CENTER FOR NUMERICAL METHODS IN ENGINEERING (CIMNE) | Spain**

##### **Visiting Scholar / Postdoctoral Researcher | 2011 – 2012**

- Collaborated on international software testing and validation for advanced CFD codes.
- Conducted comparative research on discrete particle methods to enhance FSI accuracy.

## CSIC RESEARCH INSTITUTE | China

### Design Engineer | 2003 – 2004

- Engineered ship structural designs, stability calculations, and Finite Element Analysis (FEA) for commercial vessels.

### Legal Knowledge relating to Shipping, Arbitration Practice and Procedure:

1. Graduate Certificate in International Arbitration (NUS) 2022.
2. Conduct Expert determination on issues related to Wind farm installation vessel design.
3. Act as expert witness in various arbitrations and court proceedings. For example:
  - Cases resolved in LMAA: involving claims for new-build bulk carrier design defects, ranging from USD 27 million to 43 million.
  - Cases resolved in HKIAC: involving a claim for offshore vessel design defects, in excess of USD 10 million.
  - Cases resolved in Singapore and Malaysia: involving claims for welding defects, cargo damages, infringement of copyright, ranging from USD 500,000 to 2 million.
  - Cases resolved in Denmark (Maritime and Commercial Court): involving a claim in excess of USD 1 million for propeller damage and repair.
  - Cases resolved in New Zealand high court: involving a claim for mooring failure in excess of USD 2 million.

### Publications:

#### Intellectual Property

- Patent: Liquid stabilizing device | Inventors: Chan Ghee Koh, Mimi Gao, Chao Luo. Filed & Registered in: China (CN102917967), Japan (JP2013527070), South Korea (KR1020130055603).

#### Keynote Presentations

- Keynote Speaker (2025): "Advanced Numerical Analysis used in Marine Forensic Investigations" – 5th Workshop on Civil and Environmental Engineering, National University of Singapore.

#### Journal papers:

1. Min Luo, C. G. Koh, Wei Bai, Mimi Gao (2016), A particle method for two-phase flows with compressible air pocket, *International Journal for Numerical Methods in Engineering* 108:695-721; DOI: 10.1002/nme.5230.
2. Min Luo, C. G. Koh, Mimi Gao, Wei Bai (2015), A particle method for two-phase flows with large density difference, *International Journal for Numerical Methods in Engineering* 103(4):235-255; DOI: 10.1002/nme.4884.
3. Mimi Gao, C. G. Koh, Min Luo, Wei Bai (2014), Modelling of breaking waves in Tsunami and sloshing waves by a new particle method; *International Journal of Modern Physics*, DOI: 10.1142/S2010194514603755.
4. C. G. Koh, Min Luo, Mimi Gao, Wei Bai (2013), Modelling of liquid sloshing with constrained floating baffle. *Computers & Structures*, 122:270-279, DOI:10.1016/j.compstruc.2013.03.018.
5. C. G. Koh, Mimi Gao, Chao Luo (2012), A new particle method for simulation of incompressible free surface flow problems. *International Journal for Numerical Methods in Engineering* 89(12):1582-1604, DOI: 10.1002/nme.3303.

#### Conference papers:

6. Yu Chen, Yali Zhang, Mimi Gao, et al. (2015) OMAE2015-41807 NUMERICAL SIMULATION OF OBLIQUE WAVE IN WATER BASIN, DOI: 10.1115/OMAE2015-41807.
7. C.G. Koh, Min Luo, Wei Bai, Mimi Gao (2015), Modelling of wave impact on structures, Conference: The 11th International Conference on Shock and Impact Loads on Structures.

8. C. G. Koh, Min Luo, Wei Bai, Mimi Gao (2015), Simulation of Wave Impact with Compressible Air Entrainment Based on Consistent Particle Method, Conference: The 34th International Conference on Ocean, Offshore and Arctic Engineering (OMAE), DOI: 10.1115/OMAE2015-41107.
9. C. G. Koh, Min Luo, Mimi Gao, Wei Bai (2014), An improved consistent particle method for two-phase flows with large density difference, Conference: Proceedings of 33rd International Conference on Ocean, Offshore and Arctic Engineering (OMAE).
10. C. G. Koh, Min Luo, Mimi Gao, Wei Bai (2014), A particle method for incompressible and compressible two-phase flows, Conference: Proceedings of 11th International Conference on Hydrodynamics (ICH2014).
11. C. G. Koh, Min Luo, Mimi Gao, Wei Bai (2013) Modelling of liquid sloshing with constrained floating baffle, Proceedings of 7th MIT Conference on Computational Fluid and Solid Mechanics.
12. Mimi Gao, C. G. Koh, Min Luo, Wei Bai (2013), Modelling of breaking waves in Tsunami and sloshing waves by a new particle method; Conference: Proceedings of 5th International Symposium on physics of fluids.
13. C. G. Koh, Min Luo, Mimi Gao, Wei Bai (2013), Numerical and experimental study of violent sloshing in a prismatic tank, Conference: The twenty-sixth KKHTCNN symposium on Civil Engineering.
14. Mimi Gao, C. G. Koh, Chao Luo (2008), Numerical and Experimental Studies of Liquid Sloshing in Rectangular Tanks Using a Particle Method, Conference: The 27th International Conference on Offshore Mechanics and Arctic Engineering OMAE 2008 Portugal, DOI: 10.1115/OMAE2008-57735.