Mohamed M. Kamra

Assistant Professor at the Research Institute for Applied Mechanics
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Age: 34 years

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Summary

- I am an assistant professor at the Research Institute for Applied Mechanics (RIAM) in Kyushu University, Japan. I study foundational topics in computational fluid dynamics and recently involving high-order methods and machine learning.
- I am interested in developing a career that combines teaching and research that can better our understanding of complex fluid phenomena.
- My current research focus is the development of next-generation computationally efficient fluid simulators that can be applied to multi-physics real-world applications related to aerospace, environmental, and renewable energy.

Employment

Assistant Professor | RIAM, Kyushu University | Fukuoka, Japan — Apr 2020 – Present
- Join an industry collabrative research project to study the dispersion of hazardous and flammable gasses.
- Join a government-funded research project to develop a next-generation design and analysis tool for tidal turbine farms.
- Provide guidance to Masters graduate students.
- Assist in CFD post-graduate courses.

Post Doctoral Research Fellow | RIAM, Kyushu University | Fukuoka, Japan — Oct 2018 – Mar 2020
- Join an industry collabrative research project to develop industrial standards for designing LNG tanks.
- Provide guidance to Masters graduate students.
- Assist in CFD post-graduate courses.

Teaching and Research Assistant | Kyushu University | Fukuoka, Japan — Oct 2016 – Sep 2018
- Assist in CFD post-graduate courses.
- Assist faculty staff in academic research.

Teaching and Research Assistant | Cairo University | Giza, Egypt — Oct 2010 – Sep 2015
- Teaching courses for the undergraduate students and assisting in Masters post graduate courses.
- Coordinate graduation projects for undergraduate students such as Design and Manufacturing of Autonomous Tailless Aircraft .
- Assist faculty staff in academic research.

Education

Ph.D. in Computational Fluid Dynamics — 2015 – 2018
Kyushu University | Fukuoka, Japan
Advisors: Prof. Changhong Hu
Thesis: Development of an Unstructured Grid Solver for Complex Wave Impact Problems

M.S. in Aerospace Engineering — 2010 – 2015
Cairo University | Giza, Egypt
Advisors: Prof. Atef O. Sherif
Thesis: GPU and Multicore Computing of Two Dimensional Incompressible Flow Using Stream Function-Vorticity Formulation

B.S. in Aerospace Engineering — 2005 – 2010
Cairo University | Giza, Egypt
Advisors: Prof. Madbouli Abd El-Rahman
Thesis: Design, Optimization and Manufacturing of a Tailless Unmanned Air Vehicle

Honors, Awards & Grant Funds

Undergraduate bachelor scholarship at Cairo University 2005 – 2010
Graduation project was awarded "Best Mechanical Project in Egypt" 2010
Awarded by the Institute of Electrical and Electronics Engineers (IEEE) in the Egyptian Engineering Day (EED)
Graduation project was awarded the 8th position prize in Samsung Real Dreams competition 2010
Post-graduate Masters scholarship at Aerospace Department at Cairo University 2010 – 2015
Scholarship for Ph.D. in Kyushu University, Japanese Government (MEXT) 2015
Awarded to 10 out of 160 international applicants
Mori Award in the Workshop on Environmental Technologies in Naval Architecture and Ocean Engineering (WETNAOE 2017) 2017
Awarded for best student presenter
Grants-in-Aid for Scientific Research (KAKENHI) 2020

Peer-Reviewed Journal Publications

Google Scholar ID: czED860AAAAJ

1. *A high order flux reconstruction interface capturing method with a phase field preconditioning procedure*
   J. Al-Salami, **M. Kamra**, and C. Hu
   Journal of Computational Physics 2021

2. *Magnetic induction and electric potential smoothed particle magnetohydrodynamics for incompressible flows*
   J. Al-Salami, C. Hu, **M. Kamra**, and K. Hanada
   International Journal for Numerical Methods in Fluids 2021

3. *An unstructured mesh method for numerical simulation of violent sloshing flows*
   C. Hu and **M. Kamra**
   Journal of Hydrodynamics 2020

4. *Experimental study of the interaction of dambreak with a vertical cylinder*
   M. Kamra, J. Salami, M. Sueyoshi, and C. Hu
   Journal of Fluids and Structures 2019

5. *Numerical and experimental investigation of three-dimensionality in the dam-break flow against a vertical wall*
   M. Kamra, N. Mohd, L. Cheng, M. Sueyoshi, and C. Hu
   Journal of Hydrodynamics 2018

6. *Modeling, System Identification, and PID-A Controller for Tethered Unmanned Quad-Rotor Helicopter.*
   T. Dief, **M. Kamra**, and S. Yoshida
   International Review of Aerospace Engineering 2017

Pre-Prints

1. *High-order flux reconstruction method for the hyperbolic formulation of the incompressible Navier-Stokes equations on unstructured grids*
   M. Kamra, J. Al-Salami, and C. Hu
   arXiv 2021

2. *A High Order Flux Reconstruction Interface Tracking Method Using Preconditioned Phase Field*
   J. Salami, **M. Kamra**, and C. Hu
   arXiv 2020

Conferences, Workshops and Symposia

1. *Numerical and Experimental Investigation of Dam-Break Flow Against a Vertical Cylinder*
   C. Hu, **M. Kamra**, and S. Watanabe
   IWWWFB 2021

2. *Numerical Simulation of Two Tidal Turbines with Free-Surface Effect*
   M. Kamra and C. Hu
   JASNAOE 2021

3. *Water tank experiment of two tidal current turbines considering the effect of waves(JPN)*
   C. Hu, S. Fukushima, **M. Kamra**, S. Watanabe, and J. Noda
   JASNAOE 2021

4. *CFD Simulation of Leaked Gas Dispersion for a LNG Powered Ship*
   L. Changhong Hu and **M. Kamra**
   ISOPE 2020

5. *Numerical study of sloshing motion on unstructured mesh using UMTHINC*
   M. Kamra and C. Hu
   IWSH 2019

6. *On the Reliability of Dam-Break Experiments.*
   C. Mohamed M. Kamra
   WETNAOE 2018

7. *Numerical Simulation of Free Surface Impact on a Vertical Cylinder Using UMTHINC*
   M. Kamra and C. Hu
   ISOPE 2017

8. *Three-Dimensionality in Dam-Breaking Flows*
   M. Kamra and C. Hu
   WETNAOE 2017

9. *Scalable Muti-GPU tridiagonal solver based on Schur-Complement Algorithm*
   M. Kamra and C. Hu
   International Conference on Parallel Computational Fluid Dynamics(ParCFD) 2016

Projects

Cavitation-Induced Vibrations in Oil Pipelines: Investigation and Damping 2014

Type: Industry Collorative Research
Role: Co-Investigator

Development of CFD method for simulating Violent Wave Impact on Complex Structure 2015 – 2018

Type: Academic Research
Role: Principle Investigator

Development of Computationally Efficient Interface Capturing Schemes 2018 – 2021

Type: Academic Research
Role: Principle Investigator

Design of LNG Sloshing Tanks Using CFD 2018 – 2020

Type: Industry Collorative Research
Role: Co-Investigator

Development of Multi-Physics CFD Solver for Magnetohydrodynamics Applications 2019 – Present

Type: Academic Research
Role: Co-Investigator

Development of High-order Navier Stokes Solver for Turbulent Incompressible Flow 2020 – Present

Type: Academic Research
Role: Principle Investigator

Numerical Study Dispersion of Hazardous Gases 2020 – 2021

Type: Academic Research
Role: Co-Investigator

Effect of Free-surface and Waves on the Performance of Two Tandem Tidal Turbines 2020 – 2021

Type: Japanese Government Supported Research
Role: Co-Investigator

Numerical Study of Vortex-Induced Vibration on the Structures of Floating Platforms 2020 – Present

Type: Academic Research
Role: Co-Investigator

Numerical Study of Air Circulation on the Deck of Car Cargo Ships 2021 – Present

Type: Industry Collorative Research
Role: Co-Investigator

Prediction of Wind and Tidal Turbine Performance using Machine Learning 2021 – Present

Type: Japanese Government Supported Research
Role: Co-Investigator

Teaching

Introduction to Aeronautics (AER 101A, AER 101B), TA	2010, 2012
Computer Application (AER112), TA	2011
Fluid and Gas Dynamics (AER 201, AER 201B), TA	2013
Incompressible Aerodynamics (AER 301A), TA	2010 - 2015
Aerodynamics II (AER 301B), TA	2010 - 2015
High Speed Aerodynamics (AER 401), TA	2014
Computational Aerodynamics (AER 402), TA	2010 - 2015
Heat Transfer and Combustion (AER 305), TA	2012
Orbital Mechanics (Elective Course) (–), TA	2010 - 2015
Analysis of Aircraft Performance (Elective Course) (AER450), TA	2010 - 2015
Technical Language (–), TA	2013 - 2015
Computatonal Fluid Dynamics (Kyushu University) (–), TA	2016 - Present
Introduction to Python Programming (Kyushu University) (2hr Seminar), Lecturer	2018 - Present

Students & Advising

Jabir Al Salami Ph.D. Student	2019 - Present
Lou Ming Tao Master Student	2020 - Present
Ruan Li Ph.D. Student	2020 - Present
Rui Yamamoto Master Student	2020 - Present

Skills

Programming Languages	C, C++, Fortran, Python, CUDA, Make, Mathematica, MAPLE, MATLAB
Frameworks	NumPy, Pandas, PyTorch, SciPy, Scikitlearn
Tools	Linux, emacs, vim, git, tmux, zsh, bash
CAE	Solidworks (CAD), FreeCAD (CAD), ANSYS Fluent(CFD), OpenFOAM (CFD), Elmer (Structural FEM), CADENCE Pointwise (Meshing Software), GMSH (Meshing Software), Salome (CAD and Meshing Software)
Languages	Arabic (Native), English (Advanced), Japanese (Intermediate)