

## Lin Fu

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Institute of Aerodynamics and Fluid Mechanics,  
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Germany

### EDUCATION

#### **Ph.D**, Fluid Mechanics

Department of Mechanical Engineering, Technical University of Munich, Munich, Germany 2013-  
Supervisor: Prof. Dr.-Ing. Nikolaus A. Adams and PD Dr.-Ing. habil. Xiangyu Hu

#### **Master of Science**, Fluid Dynamics

School of Aeronautics, Northwestern Polytechnical University, Shaanxi, P.R. China 2010-2013  
GPA: 90.15%  
Supervisor: Prof. Gao Zhenghong

#### **Bachelor of Science**, Aircraft Design Engineering

Northwestern Polytechnical University, Shaanxi, P.R. China 2006-2010  
GPA: 90.2% (Top 2/300)

### RESEARCH INTRESTS

#### **High-order numerical scheme for conservation laws**

- High-order TENO schemes (targeted ENO) for hyperbolic conservation laws.
- Low-dissipation low-dispersion optimal finite-difference schemes.
- Implicit Large Eddy (LES) simulations;

#### **Interface tracking method for multi-phase flow**

- Low-dissipation numerical approach for level-set based interface advection.
- Explicit reinitialization and extending algorithm for level-set function.
- Compressible multi-phase flow simulations, e.g. shock-bubble/shock-droplet interactions.

#### **Smoothed-particle hydrodynamics (SPH) method**

- Numerical discretization algorithms for Smoothed-particle hydrodynamics (SPH) method.
- Large-scale simulation framework for Smoothed-particle hydrodynamics (SPH) method.

#### **Partitioning and domain decomposition methods**

- Physics-driven Smoothed Particle Hydrodynamics (SPH) based partitioning method for Adaptive Mesh Refinement (AMR) mesh.
- Large-scale parallelization algorithms for the partitioning method.

## **Unstructured mesh generation**

- Meshless particle based nonuniform isotropic unstructured mesh generation.
- Anisotropic unstructured mesh generation.
- Multi-material/regional unstructured mesh generation.
- Partitioning and parallel algorithms for adaptive unstructured mesh.

## **RANS methodology for aerodynamics**

- CPU and GPU based parallel multi-block flow solvers for complex geometries, e.g. aircraft.
- High-resolution numerical methods, e.g. Riemann solver and reconstruction schemes.
- State-of-the-art turbulence models for engineering problems.

## **LANGUAGE SKILLS**

English IELTS : Listening 7.5; Reading 6.5; Writing 5.5; Speaking 5.5; Overall 6.5

Japanese : Primary

German : Primary

## **COMPUTER SKILLS**

Programming Languages: C, C++, Fortran 90/77 (skilled), Matlab, Maxima (Primary)

High Performance Computing: BOOST, TBB, MPI (skilled)

Scientific Visualization Software: Tecplot, ParaView, VisIt, Geomview, Medit (skilled)

Fundamental libraries: Voro++, MMG2D/3D, Triangle (skilled)

## **PUBLICATIONS**

- Fu, Lin, et al. , "A novel partitioning method for block-structured adaptive meshes, Part I: Theory and validation." *Journal of Computational Physics*(2016).
- Fu, Lin, et al. , "A family of high-order targeted ENO schemes for compressible-fluid simulations." *Journal of Computational Physics* 305 (2016): 333-359.
- Fu, Lin, et al. , "A multi-block viscous flow solver based on GPU parallel methodology." *Computers and Fluids* 95 (2014): 19-39.
- Fu, Lin, et al. , Application on MLP high order reconstruction scheme, *Hangkong Dongli Xuebao/Journal of Aerospace Power*, vol. 29, no. 10, pp. 2321C2330, 2014.
- Fu, Lin, et al. , Construction and application research of HLL-HLLC scheme, *Kongqi Donglixue Xuebao/Acta Aerodynamica Sinica*, vol. 32, no. 1, pp. , 2014.
- Fu, Lin, et al. , High order WENO scheme based on HLL-HLLC solver and its application, *Jisuan Lixue Xuebao/Chinese Journal of Computational Mechanics*, vol. 31, no. 1, pp. 128C134, 2014.
- Zuo, Y., Chen, P., Fu, L., Gao, Z., and Chen, G. (2015). *Advanced Aerostructural Optimization Techniques for Aircraft Design*. *Mathematical Problems in Engineering*, 2015.
- Yingtao, Zuo, Fu Lin, et al., Aerodynamic optimization design of wing-body-nacelle-pylon configuration, *Hangkong Dongli Xuebao/Journal of Aerospace Power*, vol. 28, no. 9, pp. 2009C2015, 2013.
- Yingtao, Zuo, Fu Lin, and Gao Zhenghong. "A New Robust Preconditioned GMRES Algorithm for Adjoint Equation in Aerodynamic Optimization Design." *International Journal of Aerospace and Lightweight Structures (IJALS)* 2.1 (2012).
- Zhang, Q., Z. Gao, and Lin FU, Application of unstructured grids in numerically simulating ice accretions, *Hangkong Dongli Xuebao/Journal of Aerospace Power*, vol. 26, no. 5, pp. 977C983, 2011.

- Zhang, Q., Z. Gao, and Lin FU. "Numerical simulation of ice accretions on multi-element airfoils." *Journal of Aerospace Power* 7 (2011): 006.

### **Conferences**

- "A high-order TENO scheme for the large eddy simulation of incompressible and compressible turbulence," Fu Lin, et al., *Frontiers in Applied and Computational Mathematics in honor of the 60th Birthday of Professor Chi-Wang Shu*, Division of Applied Mathematics at Brown University, January 4 - 6, 2017.
- "A physics-motivated Centroidal Voronoi Particle domain decomposition method," Fu Lin, et al., 11th International SPHERIC (SPHERIC 2016) Workshop at Technische Universität München (TUM) in Garching Germany, from June, 13-16, 2016.
- "A family of high order targeted ENO scheme for compressible fluid simulations," Fu Lin, et al., Ninth International Symposium On Turbulence and Shear Flow Phenomena (TSFP-9), the university of Melbourne, Australia from 30 June to 3 July, 2015.
- "Explicit reinitialization and extending algorithms for level-set based sharp-interface method," Fu Lin, et al., Ninth International Symposium On Turbulence and Shear Flow Phenomena (TSFP-9), the university of Melbourne, Australia from 30 June to 3 July, 2015.
- "Physics-driven approach to load balancing in massively parallel CFD," Fu Lin, et al., 2nd Frontiers in Computational Physics Conference: Energy Sciences, 3-5 June 2015, ETH university, Zurich, Switzerland.
- "Numerical simulation of shock bubble interaction with a conservative sharp interface model," Fu Lin, et al., 2nd International Conference on Numerical Methods in Multiphase Flows (ICNMMF-II), the university of Darmstadt, Germany, from June 30 to July 2 in 2014.

### **HONORS**

China Scholarship Council (CSC) scholarship (NO. 201206290022), provided by China Scholarship Council

The third prize in the competition of Mechanics (2008), provided by The Chinese Society of Theoretical and Applied Mechanics

National scholarship (2008-2009), provided by Chinese Ministry of Education

First-class scholarship (2008-2009), provided by AVIC The First Aircraft Institute

First-class scholarship (2006-2007), provided by China Airborne Missile Academy

Outstanding scholarship (2006-2010), provided by Northwestern Polytechnical University (4 times)