Fei Shen

Personal Information

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Date of Birth: Nov. 10, 1986
Native Place: Hubei Province, P.R. China
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Education

- **Ph.D.** in **Solid Mechanics** 9/2009 ~ 12/2015
  School of Aeronautic Science and Engineering, Beihang University
- **B.E.** in **Aerospace Engineering** 9/2005 ~ 7/2009
  School of Astronautics, Beihang University
  Top 9/93 Postgraduate recommendation

Research Interests

- **Fretting fatigue and wear**
  - Fretting fatigue crack initiation behavior
  - Numerical simulation of wear
  - Finite element simulation of fretting fatigue life prediction
  - Effect of stress gradient on fretting fatigue life
- **Continuum damage mechanics and its applications in multi-axial fatigue and fretting fatigue**
  - Fatigue damage evolution model
  - Damage coupled constitutive model of metallic material
  - Numerical algorithm of fatigue life prediction using continuum damage mechanics approach
- **Computational mechanics**
  - Constitutive model of cyclic plastic deformation for typical metallic materials
  - Finite element implementation of inelastic constitutive model

Research Experience

- **Fretting fatigue crack initiation behavior using damage mechanics approach** 6/2012 ~ present
  Sponsor: National Natural Science Foundation of China (Grant number: 11002010)
  - Finite element simulation of fretting contact
  - Study of the effect of wear on stress and fretting fatigue life
  - Fretting fatigue life prediction by combining the damage coupled elastic-plastic constitutive model, damage evolution model and wear model
  - Finite element implementation of the approach using user subroutines in ABAQUS
  - Analysis of the effect of stress gradient on fretting fatigue life

- **Fatigue life prediction of notched specimen** 8/2013 ~ 12/2014
  - Stress strain response at the notch tip using damage coupled elastic-plastic constitutive model
  - Fatigue damage accumulation by adopting two kinds of damage evolution model
  - Finite element implementation of fatigue life prediction
- **Statics and dynamics simulation of satellite components** 6/2013 ~ 9/2013
  - Simplify the finite element model of satellite components
  - Statics and dynamics simulation including under the shock and random vibration in ANSYS
- **Fatigue life prediction of riveted lap joint in aircraft structures** 8/2011 ~ 6/2012
  - Simulation of stress at the hole edge
  - Fatigue damage evolution model and parameters identification
  - Numerical algorithm of fatigue life prediction using APDL in ANSYS
- **Analysis on the wire support system in the wind tunnel** 2/2011 ~ 6/2011
  - Modeling of wire support system based on the principle of force equilibrium and calculate the pre-tightening force of each wire
  - Validation of the results by finite element simulation in ANSYS
- **Numerical simulation on the suspension bridge** 10/2010 ~ 12/2010
  - Finite element modeling of the suspension bridge in ANSYS and determine the pre-strain of cables
  - Modal analysis of the suspension bridge to calculate the resonant frequency

Academic qualification

- Five years' experience in the integrated study of continuum damage mechanics, fatigue theory, fretting fatigue and wear
- Expertise in damage mechanics approach and multi-axial fatigue criteria for fatigue life prediction of metallic materials
- Expertise in Finite Element Analysis and the finite element software packages ABAQUS, ANSYS
- Excel at the constitutive models of cyclic plasticity and the finite element implementation in ABAQUS
- Excel at C/C++, Fortran, MATLAB and Python

Publications

Journal Articles

1. **Fei Shen**, Weiping Hu, Qingchun Meng. A damage mechanics approach to fretting fatigue life prediction with consideration of elastic–plastic damage model and wear, *Tribology International*, 82, 176-190, 2015.
2. **Fei Shen**, Weiping Hu, George Z. Voyiadjis, Qingchun Meng. Effects of fatigue damage and wear on fretting fatigue under partial slip condition. *Wear*, 338-339, 394-405, 2015.
3. **Fei Shen**, George Z. Voyiadjis, Weiping Hu, Qingchun Meng. Analysis on the fatigue damage evolution of notched specimens with consideration of cyclic plasticity. *Fatigue and Fracture of Engineering Materials and Structures*, 38, 1194-1208, 2015.
4. **Fei Shen**, Weiping Hu, Qingchun Meng. New approach based on continuum damage mechanics with simple parameters identification to fretting fatigue life prediction. *Applied Mathematics and Mechanics*, 36(12), 1539-1554, 2015.
5. **Fei Shen**, Weiping Hu, Qingchun Meng, Miao Zhang. A new damage mechanics based approach to

fatigue life prediction and its engineering application. *Acta Mechanica Solida Sinica*, 28(5), 510-520, 2015.

6. **Fei Shen**, Weiping Hu, Qingchun Meng. A non-local approach based on the hypothesis of damage dissipation potential equivalence to the effect of stress gradient in fretting fatigue. *International Journal of Fatigue*. (Under review)
7. Ying Sun, Weiping Hu, **Fei Shen**, Qingchun Meng, Yuanming Xu. Numerical simulations of the fatigue damage evolution at a fastener hole treated by cold expansion or with interference fit pin. *International Journal of Mechanical Sciences*. (Under review after revision)

Conference Paper

1. **Fei Shen**, Miao Zhang, Weiping Hu, Qingchun Meng. Finite element analysis of large span suspension bridge. *Proceedings of the fourth international conference on modelling and simulation*, Phuket, Thailand, April 25-27, 2011.

Journal Paper Reviews

International Journal of Damage Mechanics

Fatigue and Fracture of Engineering Materials and Structures