

Dr. Fan Shi

Office 563, City & Guilds Building
South Kensington, London, SW7 2AZ, UK

Mobile: +44 7725 700118
E-mail: f.shi12@imperial.ac.uk

BIOGRAPHY

01/2016-08/2018: **Research Associate**, Department of Mechanical Engineering, Imperial College London, London, UK

09/2012-12/2015: **Ph.D.**, Department of Mechanical Engineering, Imperial College London, London, UK

Thesis: Elastic wave scattering from random rough surfaces (Best Ph.D. Thesis, full scholarship)
Supervisors: Prof. Mike Lowe (FREng) and Prof. Richard Craster

09/2010-06/2012: **M.S.**, Department of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, USA

Full scholarship funded by Air Force Research Laboratory

09/2006-06/2010: **B.S.**, Acoustics, Department of Electronic Science, Nanjing University, Nanjing, China

RESEARCH INTERESTS

Acoustics/Ultrasound, Nondestructive Evaluation, Defect Characterization, Metamaterials, Theoretical and Computational Elastic Waves, Ultrasonic Imaging, Structural Health Monitoring

HONORS AND AWARDS

2016, Unwin Prize for the Best Ph.D. Thesis, Imperial College London

2012, EPSRC Funded Scholarship for Ph. D

2010, Airforce Funded Scholarship for Master

2010, 2009, Excellent Student Scholarship, Nanjing University

2010, Chien-Shiung Wu Scholarship, Nanjing University

PUBLICATIONS

In Print, In Press and Accepted

[1] **F. Shi** and P. Huthwaite, "Ultrasonic wave-speed diffraction tomography with undersampled data using virtual transducers," *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, vol. 65, pp. 1226-1238, 2018.

[2] W. Choi, **F. Shi**, and M. Lowe, "Rough surface reconstruction from real surface for three dimensional simulations of ultrasonic reflection," *NDT E Int.*, vol. 98, pp. 27-36, 2017.

[3] **F. Shi**, M. Lowe, and R. Craster, "Diffusely scattered and transmitted elastic waves by randomly rough solid-solid interfaces," *Phys. Rev. B*, vol. 95, 214305, 2017.

[4] **F. Shi**, E. Skelton, M. Lowe and R. Craster, "A time-domain finite element boundary integral approach for elastic wave scattering," *Comput. Mech.*, ISSN: 0178-7675, pp. 1-13, 2017.

[5] **F. Shi**, M. Lowe, and R. Craster, "Recover correlation function of internal rough surfaces using diffusely scattered elastic waves," *J. Mech. Phys. Solids*, vol. 99, pp. 483-494, 2017.

[6] **F. Shi**, X. Xi, M. Lowe and R. Craster, "Diffuse scattered field of elastic waves from randomly rough surfaces using an analytical Kirchhoff theory," *J. Mech. Phys. Solids*, vol. 92, pp. 260-277, 2016.

[7] **F. Shi**, W. Choi, E. Skelton, M. Lowe and R. Craster, "The validity of Kirchhoff theory for scattering of elastic waves from rough surfaces," *Proc. R. Soc. A*, vol. 471, 2015.

[8] **F. Shi**, W. Choi, E. Skelton, M. Lowe and R. Craster, "A time domain finite element boundary integration method for ultrasonic non-destructive evaluation," *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, vol. 61, pp. 2054-2066, 2014.

[9] **F. Shi**, J. E. Michaels and S. J. Lee, "In situ estimation of applied biaxial loads using Lamb waves," *J. Acoust. Soc. Am.*, vol. 133, no. 2, pp. 677-687, 2015.

Under Review and In Preparation

[10] **F. Shi**, Q. Lei, "Simulation of elastic wave propagation in random fractured porous media," *Geophys. J. Int.*, in preparation for submission, 2018.

[11] **F. Shi**, "Reliable ultrasonic detection and assessment of random rough defects using multiple frequency data," *Struct. Health Monit.*, in preparation for submission, 2018.

[12] S. Haslinger, **F. Shi**, M. Lowe and R. Craster, "Shear wave scattering from randomly rough surfaces," *J. Sound Vib.*, in preparation for submission, 2018.

Conference papers

[15] **F. Shi**, W. Choi, E. Skelton, M. Lowe, and R. Craster, "Investigation of the validity of the elastic Kirchhoff approximation from rough cracks using a finite element approach," in *Review of Progress in Quantitative Nondestructive Evaluation*, vol. 1430, pp. 1567-1574, edited by D. O. Thompson and D. E. Chimenti, AIP, 2014.

[16] W. Choi, E. Skelton, **F. Shi**, M. Lowe, and R. Craster, "Rough surface reconstruction for ultrasonic NDE simulation," in *Review of Progress in Quantitative Nondestructive Evaluation*, vol. 1581, pp. 587-594, edited by D. O. Thompson and D. E. Chimenti, AIP, 2014.

[17] **F. Shi**, J. E. Michaels and S. J. Lee, "An ultrasonic guided wave method to estimate applied biaxial loads," in *Review of Progress in Quantitative Nondestructive Evaluation*, vol. 1430, pp. 1567-1574, edited by D. O. Thompson and D. E. Chimenti, AIP, 2012.

CONFERENCE PRESENTATIONS AND INVITED TALKS

[1] **F. Shi**, Plasmonics and Metamaterials Seminar, May 11, 2016, London, UK.
"Rough surface scattering in elasticity"

[2] P. Huthwaite and **F. Shi**, *Review of Progress in Quantitative Nondestructive Evaluation*, 16-19 Jul, 2017, Burlington, USA.

[3] **F. Shi**, M. Lowe, and R. Craster, *Review of Progress in Quantitative Nondestructive Evaluation*, 25-31 Jul, 2016, Atlanta, USA.

[4] **F. Shi**, M. Lowe, and R. Craster, *Review of Progress in Quantitative Nondestructive Evaluation*, Jul. 25-31, 2015, Minneapolis, USA.

[5] M. Lowe, **F. Shi**, and R. Craster, *9th Conference of the GDR: Wave Propagation in Complex Media for Quantitative Non-destructive Evaluation*, Dec. 7-11, 2015, Aussois, France.
"Diffuse scattered field of elastic waves from randomly rough surfaces"

[6] **F. Shi**, W. Choi, E. Skelton, M. Lowe, and R. Craster, *Review of Progress in Quantitative Nondestructive Evaluation*, Jul. 20-25, 2014, Boise, ID, USA.

[7] W. Choi, E. Skelton, **F. Shi**, M. Lowe, and R. Craster, *Review of Progress in Quantitative Nondestructive Evaluation*, Jul. 20-25, 2014, Boise, ID, USA.

[8] **F. Shi**, W. Choi, E. Skelton, M. Lowe, and R. Craster, *8th Conference of the GDR: Wave Propagation in Complex Media for Quantitative Non-destructive Evaluation*, Jun. 23-27, 2014, Grogynog, UK.

[9] **F. Shi**, W. Choi, E. Skelton, M. Lowe, and R. Craster, *UK Research Centre in NDE Research Meeting*, Sep. 3-7, 2013, Glasgow, UK.

[10] **F. Shi**, J. E. Michaels and S. J. Lee, *Review of Progress in Quantitative Nondestructive Evaluation*, Jul. 17-22, 2011, Burlington, VT, USA.

INDUSTRIAL CONSULTING EXPERIENCE

11/2016-01/2017: **Consultant**, Warrington, UK

Project: Numerical modelling of ultrasonic NDE for welding inspections

Client: Amec Foster Wheeler UK

10/2015-12/2015: **Consultant**, London, UK

Project: Simulation of ultrasonic signals from rough bore interfaces

Client: EDF Energy UK

08/2013-10/2013: **Consultant**, London, UK

Project: Finite element modeling of ultrasonic guided waves in boiler spine for nuclear power plant

Client: EDF Energy UK

TEACHING EXPERIENCE

11/2016-12/2016: **Short-term inspection course trainer**, Amec Foster Wheeler, Warrington, UK

Instructor of 'Finite element simulation of ultrasonic inspections' for nuclear engineers in Amec

09/2017-present: **Teaching Assistant**, Department of Mechanical Engineering, Imperial College

London, London, UK

Undergraduate Courses: *Mathematics, Applied Mathematics*

PROFESSIONAL AFFILIATIONS

Acoustical society of America, British Institute of Non-destructive Testing, IEEE, Institute of Physics