DR JOSEPH AHN MEng PhD DIC

Research Associate in Mechanics of Materials
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EDUCATION

- Imperial College London, PhD in Mechanical Engineering (2012 - 2016)
  - Supervisor: Prof John P. Dear and Dr Catrin M. Davies
  - Dissertation: Experimental Characterisation and Numerical Simulation of Fibre Laser Welding of AA 2024-T3 and Ti-6Al-4V
- Imperial College London, MEng in Mechanical Engineering, 2:1 (2008 - 2012)
  - Supervisor: Prof John P. Dear and Dr Catrin M. Davies
  - Dissertation: Investigation on the Properties of Aluminium Alloy 2219 (1st)
  - Supervisor: Prof Peter R. N. Childs
  - Dissertation: Recycling of Plastic Wastes (1st) sponsored by Developing Technologies
- Hills Road Sixth Form College, A-Level (2006 - 2008)
  - Physics (A), Chemistry (A), Biology (A), Maths (A) and Further Maths (A)

ACADEMIC VISIT

AVIC Beijing Aeronautic Manufacturing Research Institute, Prof Li Chen, 16 June – 01 July, 2014

CONSULTING AND PROFESSIONAL EXPERIENCE

- Research Associate, Imperial College London, UK (2017 - Present)
  - Novel Manufacture of Heat Exchangers with Hiflux (Winner of Innovate UK Manufacturing and Materials Competition Research Funding)
- Imperial Consultants (ICON), UK (2012 - Present)
  - Determination of Global and Local Tensile Behaviours of Welded and Parent Inconel 625
- Samsung Semiconductor Europe Ltd., UK (2008)
  - Assisted project coordination, personnel administration and management, and produced instruction documentation

TEACHING EXPERIENCE

Imperial College London

- Master Project Supervision (2012 – 2017): Fatigue Behavior of Linear Friction Welded Titanium Alloys, Micro-Structure Analysis of Laser Beam Welding on Aluminium Alloy Components, Friction Stir Welding of AA2024, Inertial friction welding of nickel based superalloy
- Graduate Teaching Assistant (2012 – 2015): ME1 Design (Solidworks), ME2 Design (Solidworks), ME2 Vibrations, ME1 Mechanics Tutorial

FUNDING

Hiflux (Innovate UK grant) Research Associate Jan 2017 – Mar 2018
AVIC Centre PhD Studentship (bursary/fees): Oct 2012 – Sept 2016
AVIC Centre Research Assistant Bridging Funding Nov – Dec 2016
ISIS (Didcot), ILL (Lyon) and HZB (Berlin) Instrument Beam Time Award 2015 – 2016

RESEARCH INTERESTS

Numerical Simulation, ABAQUS, Arc Welding, Linear Friction Welding, Friction Stir Welding, Electron Beam Welding, Laser Beam Welding, Additive Manufacturing, Materials Modelling, Weld Modelling, Finite Element Analysis, Phase Transformation, Digital Image Correlation, Thermo-mechanical Testing, Surfi-Sculpt, Comeld, Neutron Diffraction, X-ray Diffraction, Hole-Drilling, Data Analysis, High Performance Computing, Mechanical and Product Design

SKILLS

Microsoft Office, Solidworks, ABAQUS, Python, Fortran, LabVIEW, Moldflow, Hypermesh, Matlab, Linux, Korean, English

PUBLICATIONS

Papers

In Print, In Press and Accepted

[1] Ahn, J. (2017). In situ aluminium matrix nanocomposites: A review of phase transformations. Journal of Metals (Under review)

[2] Ahn, J., He, E., Chen, L., R. C., Wimpory., Dear, J. P. & Davies C. M. (2017). Prediction and measurement of residual stresses and distortions in fibre laser welded Ti-6Al-4V considering phase transformation. Materials & Design, 115, 441-457.

[3] Ahn, J., Chen, L., He, E., Davies, C. M. & Dear, J. P. (2016). Effect of filler metal feed rate and composition on microstructure and mechanical properties of fibre laser welded AA 2024-T3. Journal of Manufacturing Processes, 24, 26-36.

[4] Ahn, J., Chen, L., Davies, C. M. & Dear, J. P. (2016). Parametric optimisation and microstructural analysis on high power Yb-fibre laser welding of Ti–6Al–4V. Optics and Lasers in Engineering, 86, 156-171.

[5] Wang, X., Ahn, J., Kaboglu, C., Yu, L. & Bamber, B. R. K. (2015). Investigation on failure modes and mechanical properties of CFRP-Ti6Al4V hybrid joints with different interface patterns using digital image correlation. Materials & Design, 101, 188-196.

[6] Wang, X., Ahn, J., Kaboglu, C., Yu, L. & Bamber, B. R. K. (2015). Characterisation of composite-titanium alloy hybrid joints using digital image correlation. Composite Structures, 140, 702-711.

[7] Wang, X., Ahn, J., Bai, Q., Lu, W., & Lin, J. (2015). Effect of forming parameters on electron beam Surfi-Sculpt protrusion for Ti–6Al–4V. Materials & Design, 76, 202-206.

[8] Davies, C. M., Ahn, J., Tsunori, M., Dye, D., & Nikbin, K. M. (2015). The Influence of Pre-existing Deformation on GMA Welding Distortion in Thin Steel Plates. Journal of Materials Engineering and Performance, 24(1), 261-273.

[9] Wang, X., Ahn, J., Bamber, B. R. K., Mao, Z. & Li. K. (2015). Investigation of failure modes and mechanical properties of hybrid joints of different interface patterns using digital image correlation. Proceedings of the 18th International Conference on Composite Structures.

[10] Ahn, J., Chen, L., Davies, C. M., & Dear, J. P. (2014). Parametric optimisation and joint heterogeneity characterization of fibre laser welding of AA 2024-T3. Proceedings of the 67th International Institute of Welding Annual Assembly.

[11] Ahn, J., Chen, L., Davies, C. M., & Dear, J. P. (2014). Digital Image Correlation for Determination of Local Constitutive Properties of Fibre Laser Welding Joints in AA 2024-T3. Proceedings of the 16th International Conference on Experimental Mechanics.

[12] Ahn, J., Chen, L., Davies, C. M., & Dear, J. P. (2014). Residual Stress Measurements in Fibre Laser Beam Welded Plates of Aluminium Alloy AA 2024-T3. Proceedings of the 16th International Conference on Experimental Mechanics.

Under Review

[13] Ahn, J., Chen, L., Davies, C. M., & Dear, J. P. (2015). Effect of filler wire feed rate on crack susceptibility of aluminum alloy 2024-T3 during 5 kW high power fiber laser welding. International Journal of Advanced Manufacturing Technology.

[14] Ahn, J., Chen, L., Davies, C. M., & Dear, J. P. (2015). Experimental study on the effects of argon and helium shielding gases on weldability and defect formation of high power fibre laser welded aluminium alloy 2024-T3. Materials Letters.

Theses

[1] Ahn, J. (2016). Experimental Characterisation and Numerical Simulation of Fibre Laser Welding of AA 2024-T3 and Ti-6Al-4V. PhD, Imperial College London

[2] Ahn, J. (2012). Investigation on the Properties of Aluminium Alloy 2219. MEng, Imperial College London

JOURNAL REVIEWS

Metallurgical and Materials Transaction A
Optics and Lasers in Engineering
Metallurgical & Materials Engineering (Editorial Board Member)
Journal of Engineering and Technological Sciences
Surface Review and Letters
The Open Mechanical Engineering Journal