Hai T. Tran, Ph.D.

Curriculum vitae

Dep. of Natural Sciences, Engineering and Technology
Point Park University
Pittsburgh, PA
USA

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EDUCATION

University of South Florida Tampa, FL, USA
12/2016 **Ph.D. in Mechanical Engineering**
Thesis: "Experimental and Computational Study on Fracture Mechanics of Multilayered Structures"
Advisors: Dr. Rebecca Cai, Dr. Alex Volinsky

RWTH Aachen University (#1 university in Germany in Mechanical Engineering) Aachen, Germany
03/2009 **M.S. in Computer aided Conception and Production in Mechanical Engineering**
Thesis: "Experimental and Numerical Investigation of Interfacial Fracture Toughness in Plastic Encapsulated Microcircuits"
Advisors: Dr. Rüdiger Schmidt, Dr. Hossein Shirangi

Hanoi University of Technology (#1 university in Vietnam in Mechanical Engineering) Hanoi, Vietnam
06/2003 **B.S. in Mechanical Engineering**
Rank #2 in the class, based on 5 year-GPA (i.e., top 5 %)

APPOINTMENTS

Point Park University Pittsburgh, PA, USA
08/2020 - present **Assistant Professor**
Department of Natural Sciences, Engineering and Technology

University of Pittsburgh Pittsburgh, PA, USA
01/2019 - 08/2020 **Postdoctoral Associate**
Department of Mechanical Engineering and Materials Science
NASA project involving fracture mechanics in metal additive manufacturing: simulations and experiments

University of Transport and Communications Hanoi, Vietnam
01/2017 - 12/2018 **Senior Tenured Lecturer/Researcher** (like Tenured Assistant Professor in the US)
03/2009 - 12/2011 Mechanical Engineering Department
10/2003 - 09/2006

University of South Florida Tampa, FL, USA
08/2012 - 12/2016 **Teaching Assistant/Research Assistant**
Mechanical Engineering Department

TEACHING EXPERIENCE

Point Park University
08/2020 - present

Dept. of Natural Sciences, Engineering and Technology

- **Under-graduate courses:**
  Statics,
  Finite Element Analysis,
  FEA with ANSYS,
  Calculus I,
  Pre-Calculus,
  Engineering Design Using Pro/Engineer (CREO),
  Machine Design.

University of Transport and Communications
01/2017 - 12/2018
03/2009 - 12/2011
10/2003 - 09/2006

Mechanical Engineering department

- **Under-graduate courses:**
  FEM-based Computer-Aided Engineering,
  Theories of Mechanisms,
  Dynamics of Machines,
  Industrial Robots,
  Mechatronics Systems,
  CNC machining.
- **Graduate course:**
  Sensors and Digital Signal Processing.

University of South Florida
8/2012 - 12/2016

Mechanical Engineering department

- **Under-graduate courses (TA):**
  Mechanics of Solids (i.e., Strength of Materials),
  Capstone Design.
- **Graduate courses (TA):**
  Fracture Mechanics,
  Advanced Materials,
  Applied Elasticity,
  Advanced Mathematics.

MENTORING AND ADVISING

Department of Mechanical Engineering, University of Transport and Communications

#	Final thesis title	Graduation term
1	Based on FEM and Virtual Crack Closure Technique investigate the fracture properties of a bi-material structure	Spring 2010
2	Application of CAD\CAM\CAE in designing and manufacturing mechanical parts	Spring 2010
3	Using CAD/CAM to design and machine metallic parts	Spring 2011
4	Application of CAE to analyze a 5-axis CNC machine	Spring 2011
5	Using CAD/CAM to design and machine metallic parts	Spring 2011
6	Using CAD/CAM to design and machine metallic parts	Spring 2011
7	Establish mathematical model and analyze the vibration of a sedan's undercarriage	Spring 2012
8	Using FEM to perform shape optimization design	Spring 2012

9	Application of Pro Engineer and Ansys to investigate the deformation and vibration of mechanical structures	Spring 2012
10	An analytical approach to design a translational roller-follower Cam mechanism. Using Ansys to analyse the structure	Spring 2017
11	Application of CAE and fracture mechanics to analyze a CNC machine structure	Spring 2018
12	Application of CAD\CAM\CAE in designing and manufacturing mechanical parts	Spring 2018
13	An analytical and FEM approach to analyze a rotational roller-follower Cam mechanism	Fall 2018
14	Based on J-integral method investigate fracture properties of bi-material structures	Fall 2018
15	Application of CAD\CAM\CAE in designing and manufacturing mechanical parts	Fall 2018
16	Application of CAD\CAM\CAE to design and manufacture a robot hand	Fall 2018
17	Application of CAD\CAM\CAE to design and manufacture a robot hand	Fall 2018

PUBLICATIONS

Google scholar: https://scholar.google.com/citations?user=UTj_hSUAAAAJ&hl=en

Peer reviewed journal articles:

1. V Pouyafar, S Aghajani, **HT Tran**, AA Volinsky, "An Investigation into the Reinforcement Loading Limit of Al7075-Al2O3 Composites Fabricated by Semi-solid Powder Processing", **submitted** to *Journal of Materials Engineering and Performance*, 2021.
2. **HT Tran**, X Liang, AC To, "Efficient prediction of cracking at solid-lattice support interface during laser powder bed fusion via global-local J-integral analysis based on modified inherent strain method and lattice support homogenization", *Additive Manufacturing* (IF: 7.17), 2020.
3. **HT Tran**, Q Chen, J Mohan, AC To, "A New Method for Predicting Cracking at the Interface between Solid and Lattice Support During Laser Powder Bed Fusion Additive Manufacturing", *Additive Manufacturing* 32 (IF: 7.17), 2020.
4. X Liang, **HT Tran** et al., "Inherent Strain Homogenization for Fast Residual Deformation Simulation of Thin-Walled Lattice Support Structures Built by Laser Powder Bed Fusion Additive Manufacturing", *Additive Manufacturing* 32, 2020.
5. **HT Tran**, T Do, W Cai, "Mitigating Early Fracture of Amorphous Metallic Thin Films on Flexible Substrates by Tuning Substrate Roughness and Buffer Layer Properties", *Thin Solid Films* 689, 2019.
6. S Shityakov, N Roewer, C Förster, **H Tran**, W Cai, B Broscheit, "Investigation of crystalline and amorphous forms of Aluminum and its alloys: computational modeling and experiment", *Nano*, 2018.
7. G Kravchenko, **HT Tran**, AA Volinsky, "Periodic cracks and temperature-dependent stress in Mo/Si multilayers on Si substrates", *Philosophical Magazine Letters*, 2018.
8. **HT Tran**, H Mraied, S Izadi, AA Volinsky, W Cai, "Optimizing ductility and fracture of amorphous metal thin films on polyimide using multilayers", *International Journal of Fracture* 204(2):129–142, 2017.
9. **HT Tran**, J Devkota, T Eggers, J Wingo, W Cai, I Skorvanek, H Srikanth, MH Phan, "Anisotropic Mechanical and Giant Magneto-Impedance Properties of Cobalt-Rich Amorphous Ribbons", *Journal of Electronic Materials* 45(4):2278-2285, 2016.
10. H Mraied, **TH Tran**, W Cai, "Fabrication and deformation of aluminum–manganese microsandwich structure", *Journal of Materials Research* 31(04):480-487, 2016.

11. Y Zhang, AA Volinsky, **HT Tran**, Z Chai, P Liu, B Tian, Y Liu, "Aging behavior and precipitates analysis of the Cu–Cr–Zr–Ce alloy", *Materials Science and Engineering: A* 650:248-253, 2016.
12. Y Zhang, AA Volinsky, HT Tran, Z Chai, P Liu, B Tian, "Effects of Ce Addition on High Temperature Deformation Behavior of Cu-Cr-Zr Alloys", Journal of Materials Engineering *and Performance* 24(10):3783-3788, 2015.
13. Y Zhang, AA Volinsky, QQ Xu, Z Chai, B Tian, P Liu, **HT Tran**, "Deformation Behavior and Microstructure Evolution of the Cu-2Ni-0.5 Si-0.15 Ag Alloy During Hot Compression", *Metallurgical and Materials Transactions A* 46(12):5871-5876, 2015.
14. **HT Tran**, MH Shirangi, X Pang, AA Volinsky, "Temperature, moisture and mode-mixity effects on copper leadframe/EMC interfacial fracture toughness", *International Journal of Fracture* 185(1-2):115-127, 2014.
15. Z Qin, X Pang, Y Yan, L Qiao, **HT Tran**, AA Volinsky, "Passive film-induced stress and mechanical properties of α-Ti in methanol solution, *Corrosion Science* 78:287-292, 2014.
16. L Zhang, H Yang, X Pang, K Gao, **HT Tran**, AA Volinsky, "TiN-Coating Effects on Stainless Steel Tribological Behavior Under Dry and Lubricated Conditions", *Journal of materials engineering and performance* 23(4):1263-1269, 2014.
17. F Ren, K Cao, J Ren, AA Volinsky, **TH Tran**, B Tian, "Numerical Calculation of the Electron Density at the Wigner–Seitz Radius Based on the Thomas–Fermi–Dirac Equation", *Journal of Computational and Theoretical Nanoscience* 11(2):344-347, 2014.
18. C Chen, **TH Tran**, AA Volinsky, "Bonded composite repair structures multiple site damage analysis", *Aircraft Engineering and Aerospace Technology* 85(3):171-177, 2013.

Conference articles:

1. **HT Tran**, Z Zhou, J Lemon, AC To, "Distortion Compensation for Additive Manufactured Components via Modified Inherent Strain Method", *Proceedings - 34th ASPE Conference* (37-42), 2019.

RESEARCH GRANTS

1. "Optimization of Mechanical and Magnetic Properties of Micro Hole-Patterned Magnetic Structures for High Performance Bio-sensing Applications"

Funding Agency:	Vietnam National Foundation for Science and Technology Development (NAFOSTED)
Awarded Date:	12/20/2017
Leadership (PI):	Hai Tran

PRESENTATIONS

Oral presentations:

1. "Residual stress induced fracture of additive manufactured parts based on modified inherent strain method", *30th Annual International Solid Freeform Fabrication Symposium,* Austin, TX, USA, 8/2019.
2. "Optimizing ductility and fracture of amorphous metal thin films on polyimide using multilayers", *Annual Conference on Science and Technologies,* University of Transport and Communications, Vietnam, 3/2017.
3. "Optimization of the ductility and the fracture properties of amorphous metallic thin films on polymers", *AVS 63rd International Symposium and Exhibition*, Nashville, TN, USA, 11/2016.

AWARDS AND HONORS

- 2017 - Journal of Science: Advanced Materials and Devices' certificate of excellence in reviewing.
- 2017 - University of Transport and Communications' certificate for excellent achievement in the year (like **"Teacher of the year"** award).
- 2012 - 2016 - Teaching and research fellowships from the University of South Florida.
- 2012 - Vietnamese Ministry of Education and Training's fellowship for outstanding Ph.D. students to pursue a Ph.D. course in the US.
- 2012 - University of South Florida IRES Summer Research fellowship in Germany.
- 2011 - University of Transport and Communications' certificate of merit for excellent achievement in head work of the school year.
- 2006 - Vietnamese Ministry of Education and Training's fellowship for the best (#1) mechanical engineering student of the university (HUT) to pursue a Master course in Germany.
- 2006 - German Academic Exchange Service - DAAD's scholarship.
- 1998 - 2003 - Hanoi University of Technology's annual scholarships for its best undergraduate students.
- 2001 - Toyota's scholarship for 100 best undergraduate students of the year nationwide.

PROFESSIONAL SERVICE

Associate editor:

- Journal of Science: Advanced Materials and Devices
  (Elsevier's, Web of Science IF = 3.78, Scopus CiteScore = 5.8, Scimago Q1)

Editorial board member:

- Transport and Communications Science Journal

Journal manuscript reviewer:

- Metallurgical and Materials Transactions A
- Journal of Electronic Materials
- Scientific Reports
- Additive Manufacturing

Others:

- 2019 - Volunteer for Postdoctoral Data & Dine Symposium at the University of Pittsburgh, PA, USA
- 2018 - Committee member of Seniors' Final Thesis Defenses, Hanoi, Vietnam
- 2018 - Committee member of Students' Research Competition, Hanoi, Vietnam
- 2017 - Committee member of Seniors' Final Theses Defense, Hanoi, Vietnam
- 2017 - Committee member of Students' Research Competition, Hanoi, Vietnam
- 2013 - Volunteer for a science fair for school students from Pinellas County, FL, USA

EXPERIMENTAL AND COMPUTATIONAL SKILLS

Computational skills:

- Finite element simulation: ANSYS (APDL coding, Workbench), ABAQUS
- Programming: MATLAB (and Simulink)
- CAD, CAM, CNC: Pro/Engineer (CREO), SpaceClaim, AutoCAD, G-code
- Dynamics simulation: ANSYS (Workbench), MSC ADAMS
- Additive manufacturing simulation: ANSYS (AM Wizard, thermal-mechanical APDL coding)
- Image processing: Digital image correlation (with MATLAB), IMAGEJ

Experimental skills:

- Mechanical properties testing (Instron 5848 MicroTester, Hysitron Triboindenter TI700, MTS 810 Materials Testing System, DTS Testing System): tensile, bending, fracture toughness, toughness, nanoindentation
- Samples preparation (CRC Sputtering Coater, E-beam deposition system, Clean room facilities, PlasmaTherm PECVD-RIE PT-700): polishing, etching, heat treatment, coating
- Surface morphology (Tencor AS 200, Dektak D150 profilometer)
- Material characterization (Hitachi SU-70 SEM, SkyScan1272 CT scanner): SEM, CT X-ray scanner
- CNC programming and machining (Sodick VL600Q, DMG Mori 1035): EDM, 3-axis CNC
- 3D scanning (3D Faro laser scanner), and 3D coordinate measuring (Brown & Sharpe Gage 2000 CMM)