

Youngung Jeong

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Education

Hanyang University , BS, Department of Materials Science and Engineering	03/01/2001 – 02/29/2008
POSTECH , MS, Graduate Institute of Ferrous Technology (supervisor: F. Barlat)	03/01/2008 – 02/28/2010
POSTECH , PhD, Graduate Institute of Ferrous Technology (supervisor: F. Barlat)	03/01/2010 – 02/28/2014

Experience

Assistant, associate professor , Changwon National University, ROK	03/01/2017 – Present
Short term visitor , Los Alamos National Laboratory, NM, USA	07/11/2024 – 08/16/2024
Guest Scientist (offsite) , Los Alamos National Laboratory, NM, USA	02/01/2022 – 02/1/2024
Postdoc , POSTECH, ROK	12/01/2016 – 02/28/2017
Research Scientist , Clemson university, SC, USA	03/01/2016 – 11/30/2016
Postdoc , NIST, MD, USA	03/01/2014 – 02/29/2016
Research Affiliate , Los Alamos National Laboratory, NM, USA	04/01/2012 – 09/30/2012
Guest Researcher , NIST, MD, USA	06/01/2011 – 12/31/2011

Selected recent publications

• Direct application of elasto-viscoplastic self-consistent crystal plasticity model to U-draw bending and springback of dual-phase high strength steel <i>International Journal of Plasticity</i> 181 B. Jeon, S.-Y. Lee, J. Lee, <u>Y. Jeong*</u>	2024
• A crystal plasticity finite element analysis on the effect of prestrain on springback <i>International Journal of Mechanical Sciences</i> 237 M. Joo, M. -S. Wi, S.-Y. Yoon, S.-Y. Lee, F. Barlat, C. N. Tomé, B. Jeon, <u>Y. Jeong*</u>,	2023
• Finite element analysis using an incremental elasto-visco-plastic self-consistent polycrystal model: FE simulations on Zr and low-carbon steel subjected to bending, stress-relaxation, and unloading <i>International Journal of Plasticity</i> 147 <u>Y. Jeong*</u>, B. Jeon, C. N. Tomé	2021
• An efficient elasto-visco-plastic self-consistent formulation: Application to steel subjected to loading path changes <i>International Journal of Plasticity</i> 135 <u>Y. Jeong*</u>, C. N. Tomé	2020

Government-funded projects

Mid-career Researcher Program (PI) , National Research Foundation of Korea	2023 - 2027
BK21 , National Research Foundation of Korea	2020 - 2027
Engineering Research Center , National Research Foundation of Korea	2018 - 2024
General Research Program (PI) , National Research Foundation of Korea	2020 - 2023
Virtual engineering platform project , Ministry of Trade, Industry and Energy	2018 - 2020
General Research Program (PI) , National Research Foundation of Korea	2017 - 2020

Skills

Constitutive modeling: Phenomenological plasticity and crystal plasticity modeling

Programming languages: Fortran, Python (NumPy, SciPy, and matplotlib), Matlab, shell scripts

Languages: Korean, English

Experimental Mechanics: uniaxial tension, shear, hydraulic bulge test, biaxial tests, digital image correlation (DIC)

Diffraction experiments: X-ray diffraction, Electron back-scattered diffraction (EBSD), Residual stress analysis

Computer skills: Linux, Git

GitHub repositories

Elasto-visco-plastic self-consistent model (private repo)

github.com/youngung/evpsc

- Extended visco-plastic self-consistent model to account for elasticity (Δ EVPC and σ EVPC)
- Stand-alone calculation capabilities
- Various example shell and python scripts as well as Jupyter notebook files
- User material subroutine (UMAT) of Abaqus/standard solver
- Written primarily in Fortran with Python and shell scripts

VPSC8 and EVPC (private repo)

github.com/Jeonbohye/VPSC8-dEVPC

- Combines VPSC8 and EVPC models
- Numerical implementation of VPSC, Δ EVPC, and σ EVPC constitutive model
- Three separate build commands for executables of VPSC8, Δ EVPC, and σ EVPC.

In-house Python scripts for texture analysis

github.com/youngung/texture3

- Can plot contoured pole figures and inverse pole figures from discrete orientations
- Written entirely in Python with open-sourced libraries including matplotlib, NumPy and SciPy
- Can generate RGB maps of EBSD (electron back-scattered diffraction) scans

Misc.

- Board member of Korean Society for Technology of Plasticity 2023-present
- Editorial board member of Korean Journal of Metals and Materials 2019-present

Full list of publications

1. Leveraging Machine Learning and Crystal Plasticity for Efficient Calibration of Yld2004-18p Anisotropic Yield Function in preparation
A. S. Ebrahim, J. Kim, Y. Jeong, T. Park, H. Lim, B. L. Kinsey, J. Ha*
2. Deformation mechanism and texture evolution in AZ31 Mg alloy under uniaxial compression: experiments and simulations submitted
Jongbin Go*, Y. Jeong*, Myeong-heom Park*, Sangwon Lee, Si Gao, Nobuhiro Tsuji
3. Reverse engineering material behavior using Bayesian inference and finite element analysis on ring-pull test submitted
B. Jeon, C. N. Tome, P. M. Beck, B. Eftinik, A. Talapatra, Y. Jeong*, L. Capolungo*
4. Role of recovery in the microstructure development and mechanical behavior of a ductile Mg-Zn-Nd-Y-Zr alloy: an analysis using EBSD data and crystal plasticity simulations submitted
José Victoria-Hernández*, Y. Jeong*, Dietmar Letzig
5. Modeling deformation, recovery, and recrystallization of tantalum using a higher order elasto-viscoplastic self-consistent model 2025
Journal of the Mechanics and Physics of Solids, 194, 105925
I. A. Riyad, B. Clausen, D. J. Savage, Y. Jeong, D. W. Brown, M. Knezevic*
6. A critical discussion of elasto-visco-plastic self-consistent (EVPSC) models 2024
Journal of Materials Research Technology, 33, 7596-7609
B. Jeon, Y. Jeong*, C. N. Tomé
7. Direct application of elasto-viscoplastic self-consistent crystal plasticity model to U-draw bending and springback of dual-phase high strength steel 2024
International Journal of Plasticity, 181, 104098
Bohye Jeon, Shin-Yeong Lee, Jinwoo Lee, Youngung Jeong*
8. Thermal ratcheting of uranium simulated with a thermo-elasto-visco-plastic self-consistent polycrystal model 2024
Journal of Nuclear Materials, 597, 155159
Youngung Jeong*, Carlos N. Tomé
9. Crystal plasticity finite element simulations on extruded Mg-10Gd rod with texture gradient 2024
Journal of Magnesium and Alloys, 12, 3409-3430
Jaeseong Lee, Dirk Steglich, Youngung Jeong*
10. A comprehensive analysis of cermet design and thermal cyclic stability via elasto-viscoplastic crystal plasticity modeling 2024
International Journal of Plasticity, 179, 104032
Glenn R Peterson, Youngung Jeong, Carlos N Tomé, Michael D Sangid*
11. Temperature-dependent behavior of CP-Ti interpreted via self-consistent crystal plasticity simulation 2024
Materials Science and Engineering: A, 890, 145904
Bohye Jeon, Min-Su Lee, Tea-Sung Jun, Youngung Jeong*

12. Finite element analysis using elasto-visco-plastic self-consistent polycrystal model for E-form Mg sheet subjected to bending 2023
Journal of Magnesium and Alloys, 11, 1393-1407
 B. Jeon, M. S. Kim, S. H. Choi, Y. Jeong*
13. A crystal plasticity finite element analysis on the effect of prestrain on springback 2023
International Journal of Mechanical Sciences 237, 107796
 M. Joo, M. -S. Wi, S.-Y. Yoon, S.-Y. Lee, F. Barlat, C. N. Tomé, B. Jeon, Y. Jeong*
14. Reconstructing orientation data from the images of IPF maps and ODF sections extracted from the literature: A data-collection method for machine learning 2023
International Journal of Plasticity, 159, 103467
 L. Kaushik, K.-S. Park, J.-G. Kim, J. Lee, Y. Jeong, S.-H. Choi*
15. Prediction and validation of stress triaxiality assisted by elasto-visco-plastic polycrystal model 2022
Korean Journal of Metals and Materials, 60, 607-618
 Jinhwa Park, Youngung Jeong*
16. In-situ neutron diffraction study of lattice deformation behaviour of commercially pure titanium at cryogenic temperature 2022
Scientific Reports, 12, 3719
 M.-S. Lee, T. Kawasaki, T. Yamashita, S. Harjo, Y.-T. Hyun, Y. Jeong, T.-S. Jun
17. Finite element analysis using an incremental elasto-visco-plastic self-consistent polycrystal model: FE simulations on Zr and low-carbon steel subjected to bending, stress-relaxation, and unloading 2021
International Journal of Plasticity, 147, 103110
Y. Jeong*, B. Jeon, C. N. Tomé
18. An efficient elasto-visco-plastic self-consistent formulation: Application to steel subjected to loading path changes 2020
International Journal of Plasticity, 135, 102812
Y. Jeong*, C. N. Tomé
19. Modelling-assisted description of anisotropic edge failure in magnesium sheet alloy under mixed-mode loading 2020
International Journal of Mechanical Sciences, 181, 105680
Y. Jeong*, Dirk Steglich
20. Extension of the VPSC model to account for elasto-visco-plastic behavior using a perturbed viscoplastic approach 2019
Modelling and Simulation in Materials Science and Engineering, 27, 085013
Y. Jeong*, C. N. Tomé
21. Superior tensile fracture strength of hot isostatically pressed TiC–steel metallic composite fabricated by a novel infiltration 2019
Materials Science and Engineering: A, 764, 138260
 S. J. Park, Y. Jeong, C. W. Kim, J. H. Lee, S. C. Cho, S. B. Lee, S. K. Lee, D. H. Kim, H. U. Hong*

22. Enhancement in viscoplastic self-consistent FLD prediction model and its application for austenitic and ferritic stainless steels 2019
Metals and Materials International, 25, 1548–1563
Y. Jeong*, T. Manninen
23. A crystal plasticity model for describing the anisotropic hardening behavior of steel sheets during strain-path changes 2018
International Journal of Plasticity,
H. Kim, F. Barlat, Y. Lee, S. Zaman, C. S. Lee, Y. Jeong*
24. A comparative study between micro- and macro-mechanical constitutive models developed for complex loading scenarios 2017
International Journal of Plasticity, 93, 212-228
Y. Jeong*, F. Barlat, C. N. Tomé, W. Wen
25. Uncertainty in flow stress measurements using X-ray diffraction for sheet metals subjected to large plastic deformations 2016
Journal of Applied Crystallography, 49, 1991-2004
Y. Jeong*, T. Gnäupel-Herold, M. Iadicola, A. Creuziger
26. Texture-based forming limit prediction for Mg sheet alloys ZE10 and AZ31 2016
International Journal of Mechanical Sciences, 117, 102-114
D. Steglich, Y. Jeong*
27. Forming limit prediction using a self-consistent crystal plasticity framework: a case study for BCC fiber textures 2016
Modelling and Simulation in Materials Science and Engineering, 24, 055002
Y. Jeong*, M.-S. Pham, M. Iaidocola, A. Creuziger, T. Foecke
28. Multiaxial constitutive behavior of an interstitial-free steel: measurements through X-ray and digital image correlation 2016
Acta Materialia, 112, 84-93
Y. Jeong*, M. Iaidocola, T. Gnäupel-Herold, A. Creuziger
29. Effect of martensitic phase transformation on the behavior of 304 austenitic stainless steel under tension 2016
Materials Science and Engineering: A, 649, 174-183
H. Wang*, Y. Jeong*, B. Calusen, Y. LiU, R. J. McCabe, F. Barlat, C. N. Tomé
30. Evaluation of biaxial flow stress based on Elasto-Viscoplastic Self-Consistent analysis of X-ray Diffraction Measurements 2015
International Journal of Plasticity, 66, 103-118
Y. Jeong, T. Gnaupel-Herold, F. Barlat, M. Iadicola, A. Creuziger, M.-G. Lee*
31. Application of crystal plasticity to an austenitic stainless steel 2012
Modelling and Simulation in Materials Science and Engineering, 20, 024009
Y. Jeong*, F. Barlat, M.-G. Lee
32. Biaxial Deformation Behavior of AZ31 Magnesium Alloy: Crystal-Plasticity-Based Prediction and Experimental Validation 2012
International Journal of Solids and Structure, 49, 3551-3561

D. Steglich*, Y. Jeong, M. O. Andar, T. Kuwabara