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 — 2024

International Journal of Plasticity 181
B. Jeon, S.-Y. Lee, J. Lee, *Y. Jeong**

- A crystal plasticity finite element analysis on the effect of prestrain on springback — 2023

International Journal of Mechanical Sciences 237
M. Joo, M. -S. Wi, S.-Y. Yoon, S.-Y. Lee, F. Barlat, C. N. Tomé, B. Jeon, *Y. Jeong**,

- 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
*Y. Jeong**, B. Jeon, C. N. Tomé

- An efficient elasto-visco-plastic self-consistent formulation: Application to steel subjected to loading path changes — 2020

International Journal of Plasticity 135
*Y. Jeong**, C. N. Tomé

Goverment-funded projects

Mid-career Researcher Program (PI), National Research Foundation of Korea	2023 - 2027
BK21, National Research Foundation of Korea	2020 - 2027
Engieering 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 (ΔEVPSC and σEVPSC)
- 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 EVPSC (private repo)
github.com/Jeonbohye/VPSC8-dEVPSC

- Combines VPSC8 and EVPSC models
- Numerical implementation of VPSC, ΔEVPSC, and σEVPSC constitutive model
- Three separate build commands for executables of VPSC8, ΔEVPSC, and σEVPSC.

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 basck-scattered diffraction) scans

Misc.

- Board member of Korean Society for Technology of Plasticity 2023-present
- Editoiral 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 Anisotorpic Yield Function — submitted
   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 — 2025
   International Journal of Plasticity, 191, 104380
   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: — 2012

Crystal-Plasticity-Based Prediction and Experimental Validation
International Journal of Solids and Structure, 49, 3551-3561
D. Steglich*, *Y. Jeong*, M. O. Andar, T. Kuwabara