

Tadele Belay Tuli

University of Siegen
PROTECH: Institute of Production Technique
Chair for Production Automation and Assembly

Mobile: +49-0152 1062 4705

Personal Email: tadele.tuli@gmail.com

URL-PERSONAL: <https://tadeletuli.com>

URL-ACADEMIC: <https://protech.mb.uni-siegen.de/fams/team/tuli.html>



Born: June 07, 1986, Shambu, Ethiopia.

Nationality: Ethiopian.

Family status: Married, and have a 4 years old daughter.

Residence status: Permanent residence (Niederlassungerlaubnis) in Germany.

Current position

09/2017 - Now *Research associate*, University of Siegen, Germany.

Areas of specialization

A researcher on collaborative robot workplace design and planning based on human motion analysis and behavior models on one hand and digital twin-based production system automation on the other for human-centric workplaces.

Appointments held

10/2008 - 08/2010 Graduate assistant, Adama Science and Technology University, Ethiopia

09/2010 - 09/2012 Assistant lecturer, Adama Science and Technology University, Ethiopia

10/2015 - 09/2017 Lecturer, Addis Ababa Science and Technology University, Ethiopia

09/2017 - Now Research Associate, University of Siegen, Germany

Education

10/2004 - 07/2008 B.Sc. in Mechanical Engineering, Bahir Dar University, Bahir Dar, Ethiopia

10/2010 - 08/2012 M.Sc. in Manufacturing Engineering, Adama Science and Technology University, Adama, Ethiopia

09/2012 - 03/2015 M.Sc. in Mechatronics Engineering, University of Trento, Trento, Italy

Grants, honours & awards

09/2012-03/2015	Opera Universitaria scholarships, University of Trento, Italy
05/2016	Best instructor of the year from Electromechanical Engineering department, AASTU
05/2017	The 2016 Merit Award nominee, University of Trento, Italy
01/2017	AASTU Internal Research Grant Award, 3D Printing Technology
8/2021	Science Communication summer school, funded by BMBF, Berlin, Germany
9/2021	Corresponding author for the <i>Best Paper Award 2021</i> , CARV/MCPC 2021, University of Aalborg, Aalborg, Denmark
6/2023	Co-author for the <i>Best Young Fellow Paper Award</i> , CARV/MCPC 2023, University of Bologna, Bologna, Italy

Skills

Language	English (fluent), German (B1), Afan Oromo (mother tongue), Amharic (fluent)
Software/IT	<i>Programming</i> : Python(advanced), Matlab(advanced), C# and C++(basic), <i>CAD modeling</i> : Tecnomatix Nx, Catia V5, Solidworks 2022, AutoCAD, FreeCAD, Meshlab (all are at intermediate level), <i>Simulation</i> : Tecnomatix Process simulate (advanced), Plant Simulation (basic) <i>Development</i> : Virtual reality and game engine based simulation e.g., using Unity3D engine (advanced), ROS1/2 (intermediate user), and <i>Services or platforms</i> : Gitlab/Github services, Latex, Window OS, Ubuntu OS, Tensorflow and keras, computer vision (image analysis), and CodeSys (PLC).
Hardware	<i>Robots hardware</i> : Kuka KR6/KR C2, Kuka KR60 Jet/KR C4, Kuka LWR 4+/KR C2, Universal robot UR5, and UR3e. <i>Sensors hardware</i> : Motion tracking Xsens IMU, IntelRealsense D435, F/T Force and torque sensor, and VR based Lighthouse sensors (HTC Vive trackers). <i>Controllers</i> : Eaton and Siemens PLC, Arduino Uno and MSP 430 micro-controllers (all are at the basic level).
Soft-skills	Experience with deadline bounded tasks and team working demonstrated in different activities including teaching, proposal writing, and project management. E.g.;
	<ul style="list-style-type: none">• The student's overall feedback in 2018 - 2023 ranges from 1.6 to 2.3 out of 5 on a scale (1 very good, 5 - very bad), which may indicate communication, student, and course management evaluation.• Participated and coordinated different project proposal writing both in organizing and joining existing consortiums for answering EU calls such as Horizon Europe (1 Funded, 2 Reviewed above threshold) and funded DFG (e.g., HiSMoT).• Demonstrated time, task, and people management skills as thesis co-supervision and associate dean position at the University of Siegen, Germany, and AASTU, Addis Ababa, Ethiopia, which includes tasks such as preparing reports, consulting students, and delivering projects meeting deadlines.
Driving license	European AM/B/L-class (received in Germany).

Publications & talks

SELECTED PEER REVIEWED JOURNAL ARTICLES

- 2019b Terefe, T. O., Lemu, H. G., K/Mariam, A., **Tuli, T. B.** (2019). "Kinematic Modeling and Analysis of a Walking Machine (Robot) Leg Mechanism on a Rough Terrain", *Advances in Science and Technology Research Journal* 13 no. 3: 43-53. DOI:10.12913/22998624/109792.
- 2020a **Tuli, T. B.**; Terefe, T. O., Ur Rashid, Md M. (2020), "Telepresence Mobile Robots Design and Control for Social Interaction", *Int J of Soc Robotics*. DOI:10.1007/s12369-020-00676-3.
- 2020b Frohn-Sørensen, P., Geueke, M., **Tuli, T.B.** et al.(2021), "3D printed prototyping tools for flexible sheet metal drawing", *Int J Adv Manuf Technol* 115, 2623–2637. DOI:10.1007/s00170-021-07312-y.
- 2022 **Tuli, T.B.**, Manns, M. & Zeller, S.(2022) "Human motion quality and accuracy measuring method for human–robot physical interactions", *Intel Serv Robotics* 15, 503–512. DOI:10.1007/s11370-022-00432-8.
- 2023 **Tuli, T. B.** and Manns, Martin (2023), "Explainable human activity recognition based on probabilistic spatial partitions for symbiotic workplaces", *International Journal of Computer Integrated Manufacturing*, 36:12, 1783-1800, DOI: 10.1080/0951192X.2023.2177742.

SELECTED PEER REVIEWED CONFERENCE PROCEEDINGS

- 2018 **Tuli, T. B.** (2018), "Mathematical Modeling and Dynamic Simulation of Gantry Robot Using Bond Graph", *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering* 4: 513 DOI:10.1007/978-3-319-95153-9_22.
- 2019a **Tuli, T. B.**; Manns, M. (2019), "Hierarchical motion control for real time simulation of industrial robots", *Procedia CIRP* 17: 132–148 DOI:10.1016/j.procir.2019.03.181.
- 2019b **Tuli, T. B.**; Manns, Martin (2019), "Real-time motion tracking for humans and robots in a collaborative assembly task", *Procedia MDPI* DOI:10.3390/ecs2-6-06636.
- 2021a **Tuli, T.B.** and Manns, M. (2022), "Comparison of AI-based Task Planning Approaches for Simulating Human-Robot Collaboration", In: A.-L. Andersen, R. Andersen, T.D. Brunoe, M.S.S. Larsen, K. Nielsen, A. Napoleone, and S. Kjeldgaard, eds. *Towards Sustainable Customization: Bridging Smart Products and Manufacturing Systems*. Cham: Springer International Publishing, 158–165. DOI:10.1007/978-3-030-90700-6_17.
- 2021b **Tuli, T.B.**, Manns, M., and Jonek, M., (2022), "Understanding Shared Autonomy of Collaborative Humans Using Motion Capture System for Simulating Team Assembly", In: A.-L. Andersen, R. Andersen, T.D. Brunoe, M.S.S. Larsen, K. Nielsen, A. Napoleone, and S. Kjeldgaard, eds. *Towards Sustainable Customization: Bridging Smart Products and Manufacturing Systems*. Cham: Springer International Publishing, 527–534. DOI: 10.1007/978-3-030-90700-6_59.
- 2021c Manns, M., **Tuli, T.B.**, and Schreiber, F.(2021), "Identifying human intention during assembly operations using wearable motion capturing systems including eye focus", *Procedia CIRP*, 104, 924–929. DOI:10.1016/j.procir.2021.11.155.
- 2021d **Tuli, T.B.**, Kohl, L., Chala, S.A., Manns, M., and Ansari, F., (2021). "Knowledge-Based Digital Twin for Predicting Interactions in Human-Robot Collaboration", In: 2021 26th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA). 1–8. DOI:10.1109/ETFA45728.2021.9613342.
- 2022a

- Tuli, T.B.**, Patel, V.M., and Manns, M. (2022), "Industrial Human Activity Prediction and Detection Using Sequential Memory Networks", In: CPSL 2022 - Conference On Production Systems And Logistics). DOI:10.15488/12144.
- 2022b **Tuli, T.B.**, Henkel, M., and Manns, M. (2022), "Latent Space Based Collaborative Motion Modeling from Motion Capture Data for Human Robot Collaboration", *Procedia CIRP*, 107, 1180–1185. DOI:10.1016/j.procir.2022.05.128.
- 2023 Jonek, M., **Tuli, T.B.**, Manns, M. (2023). A Motion Capture-Based Approach to Human Work Analysis for Industrial Assembly Workstations. In: Galizia, F.G., Bortolini, M. (eds) *Production Processes and Product Evolution in the Age of Disruption. CARV 2023. Lecture Notes in Mechanical Engineering*. Springer, Cham. DOI:10.1007/978-3-031-34821-1_5.

ORAL PRESENTATIONS AND TALKS

- 01-02/06/2017 The third Annual Research Conference organized on the theme of "Science, Technologies and Innovations for Transforming Economies" by Addis Ababa Science and Technology University, Ethiopia.
- 04-05/05/2017 The sixth Annual Research Conference organized on the theme of "Building knowledge Economy through research" by Wolaita Sodo University, Ethiopia.
- 25-27/9/2017 The first International Conference, ICT for Development of Africa, Bahir Dar, Ethiopia.
- 12-14/06/2019 The 52nd CIRP Conference on Manufacturing Systems (CMS), Ljubljana, Slovenia.
- 15-30/11/2019 6th International Electronic Conference on Sensors and Applications (ECSA-6), held online through the sciforum.net
- 22-24/9/2021 The 54th CIRP Conference on Manufacturing Systems (CMS 2021) on the theme of "Towards Digitalized Manufacturing 4.0" at the Laboratory for Manufacturing Systems (LMS) University of Patras – Greece (Virtual).
- 07-10/9/2021 The 26th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA) Västerås, Sweden (Virtual)
- 17 - 20/5/2022 The 3rd Conference on Production Systems and Logistics at the University of British Columbia, UBC in Vancouver, Canada (Virtual).

THESIS

- 2008 Tuli, . B. (2008), "Design of Solar based water purification system", (B.Sc. in Mechanical Engineering). *Grade: A (Graduated with distinction)*
- 2012 Tuli, T. B. (2012), "Finite Element Analysis of Bus Body Structures: Case study at Bishoftu Automotive and Locomotive Industry, Ethiopia" (M.Sc. in Manufacturing Engineering), LAP Lambert Academic Publishing ISBN-13: 978-3-659-25932-6. *Grade: Excellent (Graduated with very great distinction)*
- 2015 Tuli, T. B. (2015), "Task and path planning of industrial manipulator robot", (M.Sc. in Mechatronics Engineering), <http://www5.unitn.it/Biblioteca/en/Web/TesiDocente/193537>, *Grade: 28/30*

BOOKS CHAPTER

- 2023 **Tuli, T. B.**, "Chapter 20 - Path planning and simulation for prototyping bio-inspired complex shapes", Editor(s): Ajay Kumar, Ravi Kant Mittal, Abid Haleem, In *Additive Manufacturing Materials and Technologies, Advances in Additive Manufacturing*, Elsevier, 2023, Pages 325-333, ISBN 9780323918343, DOI:10.1016/B978-0-323-91834-3.00021-1.

Teaching

- WiSe (2008 - 2012) Engineering Mechanics II (Dynamics) (B.Sc., Adama Science and Technology University, Ethiopia)
- SuSe (2008 - 2012) Machine Drawing (B.Sc., Adama Science and Technology University, Ethiopia)
- WiSe (2015) Computer Integrated Manufacturing (B.Sc., AAIT, AAU, Ethiopia)
- WiSe (2016 - 2017) Introduction to Robotics and Control, Industrial Automation (B.Sc., AASTU, Ethiopia)
- SuSe (2016 - 2017) Industrial Automation (B.Sc., AASTU, Ethiopia)
- SuSe (2018) Automatisierteproduktionprozesse (B.Sc., Uni-Siegen, Germany)
- WiSe (2019 - now) Automation and Industrial Communication (M.Sc., Uni-Siegen, Germany) (In collaboration with Prof. Dr.-Ing. Schröder)
- SuSe (2020 - 2021) Industrial Robotics (M.Sc., Germany) (In collaboration with other colleagues)

Service to the profession

- 2015 - Now Member of IEEE, RAS(2015 -), IES(2021 -)
- 2019 - Now Reviewer for 14+ journal articles from IEEE IES, Elsevier and Springer journals.
- 2020 - 2021 Session chairperson on various conferences such as IEEE ETFA 2021, CIRP CMS 2020 and 2021, and CARV 2021.

I confirm that the information provided above is true to the best of my knowledge and I authorize to use the data only for the recruitment as the law.

Last updated: January 4, 2024 •