



# TINSAE GEBRECHRISTOS DULECHA

Full-Stack Developer & Applied ML/Computer Vision Researcher (PhD)

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github.com/tgdulecha

## PROFILE

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Researcher with a PhD in Computer Science and over a decade of academic research experience in machine learning, deep learning, and computer vision, with a specific focus on Reflectance Transformation Imaging (RTI) and material appearance analysis for cultural heritage applications. Author of multiple peer-reviewed journal and conference publications, with research spanning neural network optimization, knowledge distillation, and computer-vision pipelines for real-world imaging problems. Experienced in supervising and co-supervising undergraduate and graduate theses, and in university teaching at both the bachelor's and master's level. Complements this research background with hands-on industry experience in full-stack software development (Vue.js/TypeScript, Java EE, PostgreSQL), providing a strong foundation for applied, interdisciplinary, and collaborative research.

## CORE SKILLS

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- Frontend: Vue.js, TypeScript, JavaScript, Angular, HTML5, CSS3, Bootstrap, RxJS, jQuery, Angular Material
- Backend: Java (Spring Boot, Java EE/JPA-Hibernate), Python (Flask, FastAPI), PHP (Vanilla, Laravel)
- Data: PostgreSQL, MySQL, JPA/Hibernate (ORM), pgAdmin/phpMyAdmin
- Machine Learning / CV: Python (NumPy, pandas, scikit-learn, PyTorch, Keras), OpenCV, Matplotlib, Seaborn
- DevOps & Tooling: Git/GitHub, Docker & Docker Compose, Kubernetes (basic), CI/CD pipelines, Maven, NPM, Postman, VS Code, IntelliJ IDEA, PyCharm
- Languages: English (C1), Italian (B2), Amharic/Oromo (native)

## WORK EXPERIENCE

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### Junior Full Stack Developer — Previnet SPA

Feb 2026 – Jul 2026

- Developed and maintained features for the Prism IGP platform using Vue.js/TypeScript on the frontend and Java EE (WildFly) with JPA/Hibernate and PostgreSQL on the backend.
- Built UI components and data-driven views using the company's internal component library, integrating grid/table components and dynamic forms.
- Wrote and optimized SQL/PostgreSQL queries against complex relational schemas, including reporting and data-refresh workflows.
- Collaborated with the team on debugging, code review, and Git-based branching workflows (feature/hotfix/release).

### Research Fellow — University of Verona – Dept. of Engineering for Innovation Medicine

Feb

2024 – Jul 2025

- Conducted research on Reflectance Transformation Imaging (RTI), optimizing neural-based RTI through a compact knowledge-distillation framework to reduce model complexity while preserving reconstruction accuracy.
- Results published in one peer-reviewed journal and one conference paper.

### Research Fellow — Ca' Foscari University of Venice

Feb 2023 – Jan 2024

- Designed and implemented the ARgument Extractor and Analyzer (AREA), a tool that automatically identifies, extracts, and analyzes arguments from online debate platforms to support discourse-analysis research.

**Research Fellow (Digital Humanities Project Officer)** — University of Verona – Dept. of Culture and Civilization *Sep 2021 – Jan 2023*

- Built a web-based content management system (PHP, MySQL, Bootstrap, HTML5, JavaScript, CKEditor) enabling real-time content editing for the principal investigator.
- Designed a database for storing, retrieving, and exporting archaeological data on Roman emperors, published at [ercresp.info](http://ercresp.info).

**Research Scholarship Holder** — University of Verona – Dept. of Computer Science *Jan 2021 – Jun 2021*

- Researched and benchmarked photometric-stereo techniques for cultural-heritage imaging applications.

**Research Fellow** — Ca' Foscari University of Venice – European Centre for Living Technology *Oct 2016 – Oct 2017*

- Designed and implemented a computer-vision pipeline for beverage product recognition from refrigerator-shelf images; results published in Lecture Notes in Computer Science.

**Research Fellow** — IUAV University of Venice *Dec 2014 – Nov 2015*

- Developed a client-server augmented-reality framework for real-time visualization and interaction with 3D architectural models.

**Lecturer** — Hawassa University, Institute of Technology *Mar 2016 – Oct 2016*

- Taught laboratory sessions for Introduction to Information Storage and Retrieval, guiding students through core algorithms in C++.

**Pre-Sales Engineer** — Ethio Telecom, Addis Ababa *Jan 2011 – Oct 2012*

- Provided technical consulting and solution design for enterprise customers; prepared technical proposals and implemented tailored services.

**Programmer** — Ethiopian Telecommunications Corporation, Addis Ababa *Sep 2007 – Oct 2011*

- Developed internal software tools to streamline operations; delivered training for customer-care and billing teams.

## EDUCATION

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PhD in Computer Science — University of Verona (2021). Appearance measurement and analysis from multi-light image collections using machine learning/deep learning.

MSc in Computer Science — Ca' Foscari University of Venice (2014). Computer vision, AI, data and web mining.

BSc in Computer Science — Hawassa University (2007).

## TEACHING

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- 2021/2022 — Principles of Data Science, Master's Degree in Data Science, Bulehora University, Ethiopia.
- 2016/2017 — Introduction to Information Storage and Retrieval, Bachelor of Science in Computer Science, Hawassa University, Ethiopia.

## STUDENT SUPERVISION

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- 2022/2023 — Ethiopian Agricultural Commodity Price Prediction Using Deep Learning and Time Series Algorithms, Master's Thesis, Bulehora University.
- 2022/2023 — Design Space Exploration and Optimization of Mechanical Components Using Machine-Learning Techniques, Master's Thesis, Hawassa University, Ethiopia.
- Supervisor of more than 10 Bachelor's theses in Computer Science, Hawassa University, College of Informatics.
- Co-supervisor of 2 Master's theses and 3 Bachelor's theses in Computer Science, University of Verona, Department of Computer Science.

## PUBLICATIONS

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- Fast and Accurate Neural Reflectance Transformation Imaging through Knowledge Distillation, Computer Graphics, 133:104475 (2025)
- DisK-NeuralRTI: Optimized NeuralRTI Relighting through Knowledge Distillation (2024)
- Neural Reflectance Transformation Imaging, The Visual Computer, 36(10):2161–2174 (2020)
- SynthPS: A Benchmark for Evaluation of Photometric Stereo Algorithms for Cultural Heritage Applications, GCH 2020
- State-of-the-Art in Multi-Light Image Collections for Surface Visualization and Analysis, Computer Graphics Forum, 38(3):909–934 (2019)
- Crack Detection in Single- and Multi-Light Images of Painted Surfaces Using Convolutional Neural Networks (2019)
- MLIC-Synthetizer: A Synthetic Multi-Light Image Collection Generator (2019)
- Objective and Subjective Evaluation of Virtual Relighting from Reflectance Transformation Imaging Data (2018)
- Artworks in the Spotlight: Characterization with a Multispectral LED Dome, IOP Conference Series: Materials Science and Engineering (2018)
- A Computer Vision System for the Automatic Inventory of a Cooler (2017)
- Replicator Equation: Applications Revisited (2017)
- Full list of publications available on [Google Scholar](https://scholar.google.com/citations?user=...).

## CONFERENCE PRESENTATIONS

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- DisK-NeuralRTI: Optimized NeuralRTI Relighting through Knowledge Distillation, STAG 2024, Verona, Italy
- Neural Reflectance Transformation Imaging, CGI 2020, Geneva, Switzerland
- SynthPS: A Benchmark for Evaluation of Photometric Stereo Algorithms for Cultural Heritage Applications, GCH 2020, Granada, Spain
- Crack Detection in Single- and Multi-Light Images of Painted Surfaces Using Convolutional Neural Networks, GCH 2019, Sarajevo, Bosnia and Herzegovina
- MLIC-Synthetizer: A Synthetic Multi-Light Image Collection Generator, STAG 2019, Cagliari, Italy
- Objective and Subjective Evaluation of Virtual Relighting from Reflectance Transformation Imaging Data, GCH 2018, Vienna, Austria

## ADDITIONAL INFORMATION

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- **Formazione Specifica in materia di Tutela della Salute e della Sicurezza dei Lavoratori Impiegati nelle Attività d'Ufficio — Classe di rischio basso (4h)**

- **Health Fitness for Duty Certification (Idoneità alla Mansione Specifica)** — issued 20 February 2026 by competent physician, Previnet SPA; outcome: fit for the specific role (idoneo alla mansione specifica); next review due by February 2031.
- Driving Licence: Category B