

DILA TURKMEN, PhD.
Development Engineer

PROFILE

I am a **Mechanical Engineer** with an MSc & PhD in System Dynamics and Control & Robotics, and **6+ years** of experience **developing engineering systems, technology concepts and technical programs.**

I structure systems for viable development, building the technical understanding **from domain-level behaviour to system-level interactions** to define architectures, cross-domain interfaces and development pathways. I identify hidden development bottlenecks and failure modes, align technical requirements across domains, and guide development through prototyping, validation and iterative technical feedback.

Interested in **R&D** or venture departments, start-ups and cross-domain organizations working on **technology maturation or innovation programs**, particularly in health- & sports-tech, scientific instrumentation and space-tech, as well as technical applications in environmental sustainability, communication, education and arts.

CORE COMPETENCIES

Physical & Cross-Domain Systems

Compliant & wearable robotics · Soft electromechanical/ Multiphysics systems · Sensors & actuators · Physical interaction & embodied systems · Multidisciplinary technical programs

Development Engineering

System architecture & integration · Cross-domain interfaces & technical translation · Requirements & constraint mapping · Bottleneck/root-cause analysis · Development road-mapping & tracking · Prototyping & experimental validation · External lab & manufacturer technical collaboration

Engineering Methods

Dynamical system modelling & simulation · Multiphysics modelling · System identification · Control · Sensor/actuator design, integration & characterization · Experimental rig design & automation · Data analysis · Prototyping & DFM

Tools

MATLAB · Simulink · Simscape · SOLIDWORKS · ANSYS · COMSOL · AutoCAD

EDUCATION

PhD – Mechanical Engineering,
System Dynamics and Control Division,
Thesis on soft robotics

Istanbul Technical University, 08/2016 – 02/2024
EPFL, Visiting PhD, 02/2022 – 02/2023

MSc – System Dynamics & Control

Thesis on 6-DOF humanoid robot arm force control
Istanbul Technical University, 09/2013 – 02/2016

BSc – Mechanical Engineering, System Dynamics & Control Minor
Istanbul Technical University, 09/2009 – 06/2013

· **Ranked 1st** ~60 in **6+** Dynamical System Modelling & Control courses across PhD, MSc, and BSc studies.

Additional – Formal education in classical ballet and contemporary dance
09/1997 – 06/2016

ITALY, Open to relocation within Switzerland,
+41 78 241 15 12, dila_turkmen@hotmail.com, LinkedIn, Publications

LANGUAGES

Turkish: Native, English: C1, French: B1, German: A1+

PROFESSIONAL EXPERIENCE

→ **Technical Lead R&D Engineer** – Postdoctoral Research Fellow 09/2024 - Present
Smart Mechatronics for Biorobotics Lab **Sant’Anna Biorobotics Institute, Italy**

- Led a small R&D team for **soft sensing integration into wearable subsystems**. Coordinated across **6 partner interfaces** of an EU consortium developing a novel **soft-exosuit**.
- Defined the **integrated-sensing architectures and development roadmap**.
- Guided **design iterations** through electromechanics grounding for experimental analysis.
- Identified and resolved **technical requirement misassumptions** in technology, product, and clinical-trial designs upfront; avoiding integration, performance and validation limitations.
- Redirected **prototyping feasibility decisions**, enabling earlier **higher-fidelity demos**.
- Delivered subsystems on-time, meeting all technical KPIs.

→ **Concept R&D Engineer** – Guest Postdoctoral Researcher 04/2025 – 09/2025
Neuromorphic Cognitive Systems Group **ETHZ & UZH, Switzerland**

- Drove the maturation of a new embodied intelligence concept on soft-neuromorphic robotics, translating across two domain leads.** From early concept to actionable R&D framework.
- Restructured the **shared technical basis and development architecture** of the technology.
- Defined **pilot implementation hardware and scenario** based on soft transducers.
- Framework **endorsed** by the external evaluation committee and adopted by domain-lead concept owners for its **cross-domain interfaces** and the bottom-up development approach.

→ **R&D Engineer** – PhD Researcher 11/2019 – 02/2024
Reconfigurable Robotics Lab **EPFL, Switzerland**
& Flexible Systems Laboratory **Istanbul Technical University, Türkiye**

- Owned the maturation and system implementation of embedded printed position sensing technology** for low radius of curvature flexure joints of small lightweight robots.
- Redesigned the **sensor, its fabrication and integration architecture**; increased longevity from **200 to 20,000+** operational cycles
- Developed **physical compensation architecture**, avoiding computational load
- Reduced performance deviation by **75%** by developing an alternative curing method.
- Resolved **down-scalability limitation** through microstructure refinement.
- Implemented in **18-g haptic device**, published in **Nature Electronics** (co-author).

→ **Co-Founder & Project Manager** – PhD Researcher 05/2021 – 02/2022
Sustainability Office **Istanbul Technical University Rectorate, Türkiye**

- Proposed and co-established Sustainability Office and its governance structure** for advancing the institutional sustainability program and international ranking applications.
- Aligned institutional policies with **SDG metrics** through policy development and revision.
- Developed **sustainability reporting framework**; has been taught to national universities.
- Increased institutional action by establishing **SDG-mapped cross-department commissions**.
- Türkiye’s **first** university sustainability office, received **Rectorate Performance Award**.

→ **Founder** – Volunteer 03/2021 – 03/2022
50th Year* – Wild, *local urban forest **Local Initiative, Türkiye**

- Established local initiative to contribute to the new municipal rewilding program.** Built and led 10-person citizen expert team, coordinated across municipal and academic stakeholders.
- Translated **public, ecosystem and municipal requirements**, resulting in the urban forest being **selected** as pilot implementation site by Istanbul Municipality, across 13 urban forests.



→ **Mechanical R&D Engineer** – MSc Researcher03/2013 – 03/2016
Automatic Control LaboratoryIstanbul Technical University, Türkiye

Responsible for modelling and force control of the 6-DOF humanoid robot arm being developed by the lab. (MATLAB Simscape, Denavit-Hartenberg, Jacobian)

- Built the system model for robot and environment interaction, reused across 5+ workstreams.
- Developed teaching and control algorithm; validated with F/T sensor-in-the-loop simulation.

→ **Teaching Assistant** – MSc & PhD Researcher02/2015 – 09/2024
System Dynamics and Control Division,Istanbul Technical University, Türkiye

Assisted 3+ undergraduate courses for 5+ terms. Built physical demonstrations and simulation models linking system behaviour to dynamics and control.

SELECTED TECHNICAL CONTRIBUTIONS

- Diagnosed actuator lag as the hidden root cause of the mismatch between the FEM model and experimental trajectories for 6-DOF compliant parallel robotic manipulator.
- Designed, built and controlled complete compact robot prototypes, implemented real-time control, prepared fabrication and assembly documentation.
- Coded experimental automation pipeline, reused across systems and institutions.
- Built lumped parameter and FEM multiphysics simulation models, informing R&D of thermomechanical, electromechanical, pneumo-mechanical and vibrational systems, including thermal safety, performance optimization, and operation physics validation decisions.
- Coded reusable simplex optimization algorithm, most downloaded Nelder – Mead algorithm in MathWorks Central.

INDUSTRIAL INTERNSHIPS

- Designed a washing-drum profile at Arçelik Product Development to reduce foam-induced motor loading; design approved for prototyping and testing. (1-month BSc internship).
- Trained in DFM for punching-line manufacturing and Kaizen practices at Dalgakıran Compressors. (1-month BSc internship)
- Developed principal-component and tree-based regression models for online estimation of cement Blaine (6-month industry-cooperative MSc research fellowship with Dal Elektrik ve Otomasyon A.Ş.)

SELECTED PARTICIPATION & PRESENTATIONS

- Demo presentations to Swiss robotics and public audiences, recognized for technical command and audience engagement.
- Executive board member (2023-2024) and community member (2023 – to present) at EELISA European University Alliance, for robotics and embodied cognition tools integration into next-gen HEI learning stations
- Invited speaker at seminar “Active Citizenship and Effective Actors in Local Movements: Constructive Discourse and Public Opinion Formation”

OTHER SKILLS

Illustration & Model Crafting