University Academic Curriculum Vitae

Personal information

Name: Gilbert Kiplangat Soto

Education since leaving school

2019: B.Sc. Mechatronics Engineering

Dedan Kimathi University of Technology https://www.dkut.ac.ke/

City: Nyeri | **Country:** Kenya | **Field(s) of study:** Mechatronics Engineering | **Final grade:** Second Class Honors (Upper Division) | **Level in EQF:** EQF level 6 | **Thesis:** PLC- Based PID Implementation for Thermal Process Control.

Research project: "PLC-Based PID Implementation for Thermal Process Control."

2020: M.Sc. Advanced Manufacturing and Automation Engineering (Master 1)

Dedan Kimathi University of Technology https://www.dkut.ac.ke/

City: Nyeri | **Country:** Kenya | **Field(s) of study:** Mechatronics Engineering | **Level in EQF:** EQF level 7

Emphasis: Manufacturing, robotics and automation.

2021: M.Sc. Control for Green Mechatronics, GREEM (Master 2)

University Bourgogne Franche-Comté https://www.ubfc.fr/

City: Besançon | **Country:** France | **Field(s) of study:** Mechatronics Engineering | **Final grade:** Bien (14.176/20) | **Level in EQF:** EQF level 7 | **Type of credits:** ECTS | **Number of credits:** 120 | **Thesis:** ***Parameter identification of the Franka Emika PANDA robot***

Emphasis: A deep understanding of mechatronic systems with a central focus on boosting their performance and energy efficiency.

2017: Certified Siemens Mechatronics Systems Assistant

Siemens Training and Research Centre (DeKUT) and SITRAIN Germany https:// siemens.dkut.ac.ke/

Field(s) of study: Mechatronics Engineering

2017: Certified Siemens Mechatronics Systems Associate

Siemens Training and Research Centre (DeKUT) and SITRAIN Germany https:// siemens.dkut.ac.ke/

City: Nyeri | **Country:** Kenya | **Field(s) of study:** Mechatronics Engineering

2018: Certified Siemens Mechatronics Systems Professional

Siemens Training and Research Centre (DeKUT) and SITRAIN Germany https:// siemens.dkut.ac.ke/

City: Nyeri | **Country:** Kenya | **Field(s) of study:** Mechatronics Engineering

Present appointment

Assistant Researcher (AR) [01/10/2025 – DATE]

Free University of Bozen-Bolzano
https://www.unibz.it/en/faculties/engineering/

City: Bolzano | **Country:** Italy | **Name of unit or department:** Engineering | **Business or sector:** Education

Project Name: *A Toolkit for Designing Human-Centered Collaborative Robotic Assembly Systems (RoboTool) + Advanced collaborative robotics*

Responsibilities:

- Working on updating guidelines to help designers, particularly those without expertise in human factors, implement anthropocentric collaborative applications more effectively. The project will cover key topics such as interaction modalities and patterns, human-centric applications design, human-machine interfaces, as well as real-time and dynamic adaptive robot behaviour.

Professional experience

From / to	Job title	Name of academic Institution	Academic level	Responsibilities
15/03/2024 – 26/09/2025	Assustant Researcher	***Free University of Bozen - Bolzano***	Masters	**Project Name:** *Innovative Worker-Centric Assessment Method for Cognitive Workload in Human-Robot Collaborative Systems in Manufacturing.*
01/03/2022 – 31/05/2022	Collaborative Researcher	***Dedan Kimathi University of Technology*** https://www.dkut.ac.ke/ **City:** Nyeri	**Country:** Kenya	Masters	**Project title**: *Nonlinear Parameter Identification of the Franka Emika PANDA Robot: A Comparative Analysis of Friction Models*

				•Investigated the effects of friction models on the accuracy of retrieved dynamic parameters for serial robots. • Published a research paper on the findings.
01/03/2021 – 24/08/2021	Research Intern	***The University of Kaiserslautern-Landau*** https://rptu.de/en/home/ **City:** Kaiserslautern | **Country:** Germany | **Name of unit or department:** Department of Electrical and Computer Engineering	Masters	**Project title**: *Parameter identification of the Franka Emika PANDA robot* •Investigated dynamic parameter identification methods for serial robots. •Developed a dynamic symbolic model for the PANDA robot. •Designed a periodic parameter exciting trajectory using nonlinear optimization techniques. •Implemented inverse dynamics controller for excitation trajectory tracking. •Set up an experiment for data acquisition and testing. •Handled data acquisition, signal processing, and quantitative analysis of the results. •Successfully retrieved and validated the dynamic and friction parameters of the PANDA robot and documented the project.
01/09/2019 – 30/09/2020	Graduate Assistant	***Dedan Kimathi University of Technology*** https://www.dkut.ac.ke/ **City:** Nyeri | **Country:** Kenya	Masters	• Assisted in teaching and tutorials at the undergraduate level. • Trained Siemens Mechatronic Systems Certification Program (SMSCP) students. • Supervised undergraduate

				labs and projects. • Evaluated undergraduate students through continuous assessment tests. • Supported departmental research initiatives.
01/05/2020 – 31/08/2020	Intern Engineer – Service Provisioning	***Safaricom PLC*** https://www.safaricom.co.ke/ **City:** Nairobi | **Country:** Kenya	Undergraduate	• Provisioned various services, including Internet, MPLS, and Cloud Computing, to over 200 enterprise customers. • Determined the most suitable media for service provisioning, leveraging technologies such as WiMAX, Fiber Active/GPON, Ceragon, and Radwin.
02/01/2018 – 30/04/2018	Mechatronic Intern	***Siemens Training and Research Centre, DeKUT*** https://siemens.dkut.ac.ke/ **City:** Nyeri | **Country:** Kenya	Professional Certification - Undergraduate	• Integrated sensors and actuators into automation systems for thermal process control, using PLC S7-1200. • Enhanced user control interface by implementing Human-Machine Interface (HMI) for efficient input management, actuator monitoring, and comprehensive process visualization. • Advanced proficiency in automation systems, process control and troubleshooting
02/01/2017 – 28/04/2017	Mechatronic Intern	***Siemens Training and Research Centre, DeKUT*** https://siemens.dkut.ac.ke/ **City:** Nyeri | **Country:** Kenya	Professional Certification - Undergraduate	• Acquired understanding of the working principles of various sensors and their real-world applications.

					• Maintained and managed electrical and mechanical components, including electrical drives, to ensure optimal performance. • Developed comprehensive knowledge of (electro) pneumatic and hydraulic control circuits, digital electronic fundamentals, and Programmable Logic Controllers (PLCs).

Participation in exhibitions (where applicable)

N/A

Experience in academic teaching

- Graduate Assistant at Dedan Kimathi University of Technology [01/09/2019 – 30/09/2020]

- Assisted in teaching and facilitating discussions at the undergraduate level.
- Trained Siemens Mechatronic Systems Certification Program (SMSCP) students.

Other academic responsibilities

- Graduate Assistant at Dedan Kimathi University of Technology [01/09/2019 – 30/09/2020]

- Supervised undergraduate labs and projects.
- Evaluated undergraduate students through continuous assessments.
- Supported departmental research initiatives.

Memberships

Engineers Board of Kenya Membership Nairobi, Kenya
• **Graduate Engineer**, Registration Number **B19478**.

Research and scholarships

- Currently working as an Assistant Researcher at the Free University of Bozen-Bolzano under the project *Innovative Worker-Centric Assessment Method for Cognitive Workload in Human-Robot Collaborative Systems in Manufacturing.*
- Summary of significant achievements in research and scholarship:
  - Graduated with a master's degree in Control for Green Mechatronics.
  - Completed a master's thesis on parameter identification for the Franka Emika PANDA robot.
  - Published a paper on *Nonlinear Parameter Identification of the Franka Emika PANDA Robot: A Comparative Analysis of Friction Models*

- Research grants and contracts – Academic researcher Dedan Kimathi University of Technology [01/03/2022 – 31/05/2022]

- The table below summarizes research and scholarship grants received in the previous years, including scholarships and grants from various institutions and bodies.

Date granted	Award Holder(s)	Funding Body	Title	Amount received
15/07/2020	Myself	French Embassy Kenya	Social Security Scholarship	€ 4000
12/07/2020	Myself	University Bourgogne Franche-Comté	Master's Scholarship Grant	€ 7000
29/01/2021	Myself	Erasmus^{+} (Bourgogne-Franche-Comté Region)	Erasmus+ Mobility grant	€ 3600
02/10/2019	Myself	Dedan Kimathi University of Technology	Master's Scholarship Grant	€ 4500

Publications

Multimodal intention recognition for dynamic tool sharing in anthropocentric human-robot collaborative applications

Ciaghi, D., Manzardo, M., Soto, G., Vidoni, R., Gualtieri, L. (2026). Multimodal Intention Recognition for Dynamic Tool Sharing in Anthropocentric Human-Robot Collaborative Applications. In: Srihari, K., Khasawneh, M.T., Yoon, S., Won, D. (eds) Flexible Automation and Intelligent Manufacturing: The Future of Automation and Manufacturing: Intelligence, Agility, and Sustainability. FAIM 2025. Lecture Notes in Mechanical Engineering. Springer, Cham.

DOI: https://doi.org/10.1007/978-3-032-07675-5_59

Nonlinear Parameter Identification of the Franka Emika PANDA Robot: A Comparative Analysis of Friction Models

Reference: G. Soto, F. Irungu Maina, and J. B. Byiringiro, "Nonlinear Parameter Identification of the Franka Emika PANDA Robot: A Comparative Analysis of Friction Models", AJEEET, vol. 4, no. 2, pp. 45–57, Nov. 2024.

DOI: https://doi.org/10.25077/ajeeet.v4i2.101

Publications <u>about</u> the applicant	N/A
Further data	N/A
Entrepreneurship	N/A
Statement of interest	I am interested in advancing the theoretical and practical guidelines for **industrial human-robot interaction (iHRI)**, covering key topics such as interaction patterns, human-machine interfaces, and the design of dynamically adaptive robot behaviour to maintain optimal physical and cognitive ergonomics for the human worker.
Other Projects	**Investigating Effects Of Infill Patterns on an FDM printed PLA Cantilever Beam** - Designed the CAD model of the beam and further optimized its parameters using Ultimaker software. - 3D printed beams with diverse printing patterns, then investigated the impact of these infill patterns on the beams' flexural rigidity. - Conducted an in-depth parametric analysis to characterize the flexural properties of the beams, using beam orientation and infill patterns as key variables. **PLC-Based PID Implementation for Thermal Process Control** - Implemented PID thermal process control utilizing a Siemens S7-1200 PLC controller. - Integrated a remote Human-Machine Interface for enhanced process visualization and modification of user inputs, such as the setpoint of the process variable.
Language competence	English **LISTENING** C1 **READING** C1 **WRITING** C1 **SPOKEN PRODUCTION** C1 **SPOKEN INTERACTION** C1 *Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user*

Date 19/11/2025 Signature