Cedric Kiplimo

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Profile Summary

Driven by a deep interest in advancing the field of robotic perception, I am a highly motivated candidate seeking a PhD. in Robotics. My academic background and expertise in areas such as computer vision, machine learning, and algorithm development have equipped me with the skills to address complex challenges in robotics. I am particularly focused on integrating data-driven methodologies to enhance robotic perception, decision-making, and adaptability, enabling systems to perform reliably in dynamic and unpredictable environments.

Education

Dedan Kimathi University of Technology (DeKUT) *Jan 2021 - Mar 2024*
MSc in Telecommunication Engineering

- Thesis title: "A method for extracting tree height, diameter at breast height, and crown diameter from horizontally displaced stereoscopic images".
- **Coursework:** Digital Image Processing, Digital Signal Processing, Probability and Stochastic Processes, Numerical Methods
- My Thesis (Link to the pdf)

Jomo Kenyatta University of Agriculture and Technology (JKUAT) *Jan 2012 - Aug 2016*
BSc in Telecommunication and Information Engineering

- Grade: First Class Honours
- Final Year Project: "ZigBee based vehicle-to-vehicle communication system".

Research Experience

Junior Research Fellow *Nyeri, KE*
Centre for Data Science and Artificial Intelligence (DeKUT) *July 2024 – Present*

- Leading a team of research interns and assistants in developing AI methodologies for application in large-scale forest monitoring in Kenya and Africa.
- Leading a team of research interns and assistants in developing AI methodologies for building nationwide high-resolution cropland dataset for Kenya.
- Supervising and guiding junior research staff in their research projects.

Research Intern *Nyeri, KE*
Centre for Data Science and Artificial Intelligence (DeKUT) *April 2023 – June 2024*

- Carrying out research on automated tree inventory using stereoscopic vision and convolutional neural networks.
- Designing and building low-cost image acquisition hardware using 3D printed materials and commercially available hardware such as the Nvidia Jetson Nano.
- Developing and training deep neural networks for performing semantic segmentation of tree trunks and full trees, as well performing tree detection.
- Building software for automatically extracting tree biophysical parameters from stereoscopic images to enable a point-and-click tree inventory system.

MSc Student *Nyeri, KE*
Dedan Kimathi University of Technology *Oct 2021 – Oct 2022*

- Investigating the theoretical concept behind stereoscopic vision and its application to various measurement problems in different contexts including forest inventory, warehouse robotics, autonomous driving, and general navigation.

- Researching the use of noncontact techniques for forest inventory such as structure from motion, terrestrial and aerial laser scanning, simultaneous localization, and mapping, as well as understanding their merits and limitations.
- Extensive research on the practice of forest inventory, tools and techniques used, and the challenges involved.
- Developing a geometric approach for extracting tree diameter at breast height, height, and crown diameter from disparity maps derived from stereo images.
- Implementing this approach with Python code to extract these tree biophysical parameters from digital images.

Additional Work Experience

Graduate Assistant *Nairobi, KE*
Department of Electrical and Electronic Engineering, Dedan Kimathi University of Technology *Jan 2021 – Mar 2023*

- Teaching courses and discussion sections at the undergraduate level.
- Grading and evaluating performance of undergraduate students.
- Collecting and processing research data for the department of Electrical Engineering.

Presales Engineer *Nairobi, KE*
Sancom Limited *April 2019 – April 2020*

- Conducting extensive research and self-driven consultation to identify the most cost effective and relevant solutions for multiple clients.
- Writing technical proposals for telecommunications and other ICT solutions to multiple clients.
- Proactively initiating and maintaining communication with multiple equipment vendors prior during the project life cycle.

Project Manager *Nairobi, KE*
Brent Networks Limited *Dec 2016 – Dec 2018*

- Supervision of telecommunication infrastructure projects from planning to commissioning.
- Installation and configuration of Ericsson Mini-Link traffic nodes and microwave transmission antennas in numerous sites.

Publications

DSAIL-TreeVision: A software tool for extracting tree biophysical parameters from stereoscopic images Feb 2024

Cedric Kiplimo, Collins Emasi Epege, Ciira wa Maina, Billy Okal

10.1016/j.softx.2024.101661

Low-Cost Non-Contact Forest Inventory: A Case Study of Kieni Forest in Kenya Mar 2024

Cedric Kiplimo, Ciira wa Maina, Billy Okal

10.3390/challe15010016

Using Drone Imagery and Deep Learning to Monitor a Reforested Stand in Kenya Oct 2024

Cedric Kiplimo, Samuel Gachana Viola Orina Ciira wa Maina, Arthur Sichangi

Conference abstract

Projects

DSAIL TreeVision *github.com/dekut-dsail/TreeVisio*

- Developed a GUI application used for estimating the diameter at breast height, tree height,and crown diameter by leveraging stereoscopic vision and deep learning.
- Tools Used: Python, Kivy

Technologies

Languages: Python, MATLAB, JavaScript

AI Technologies: PyTorch, Tensorflow, OpenCV, Scikit-Learn, JAX