# KALEAB A. KINFU

http://KaleabAlemayehu.com ⋄ kinfu@jhu.edu
⋄ Baltimore, MD, 21218 ⋄

## EDUCATION

**Johns Hopkins University, USA** *Sep 2020 - Present*
**Ph.D. in Computer Science**
M.S.E in Biomedical Engineering, *GPA: 4.0/4.0*

**Erasmus Mundus Joint Master in Image Processing and Computer Vision** *Jul 2020*
**Université de Bordeaux, France**
Master of Science (M.S.) in Computer Science, *mention très bien*
**Universidad Autónoma de Madrid, Spain**
M.S. in Image Processing and Computer Vision, *Honours*
**Pazmany Peter Catholic University, Hungary**
M.S. in Computer Science & Engineering, *Honours*

**Addis Ababa University, Ethiopia** *Jul 2017*
Bachelor of Science (B.S.) in Computer Science, *Summa Cum Laude*

## RESEARCH INTERESTS

**Computer Vision**: Activity Detection, Scene Understanding
**Machine Learning**: Robustness, Generalization, Lifelong Learning

## PUBLICATIONS & REPORTS

1. Xu, Haoyin, **Kinfu, KA**, et al. **"When are Deep Networks really better than Random Forests at small sample sizes?"** arXiv preprint (2021)
2. Kinfu, Kaleab Alemayehu. **Partition & Decode: an implicit internal representation framework**. MSE Thesis. Johns Hopkins University, 2021.

## RESEARCH SCHOOL

**The Cornell, Maryland, Max Planck Pre-doctoral Research School, Germany** *Aug 2019*
Emerging Research Trends in Computer Science

## EXPERIENCE

**Mathematical Institute for Data Science, JHU** Feb 2020 - Present
*Research Assistant* *Baltimore, USA*

· Working under the supervision of Prof. René Vidal on machine learning robustness and activity detection in videos.

**NeuroData, JHU** Sep 2020 - Present
*Research Assistant* *Baltimore, USA*

· Working under the supervision of Prof. Joshua T. Vogelstein on a framework called 'Partition and Decode' that formalizes an implicit internal representation of a large number of supervised and unsupervised machine learning methods, including decision forests and deep networks.

**Institute of Computer Graphics and Vision, TU Graz** Feb 2020 - Jul 2020
*Research Associate* *Graz, Austria*

· Worked under the supervision of Prof. Horst Bischof on my master thesis entitled 'Lifelong Learning for Autonomous Vehicles'. We investigated and developed CNN based methods for the task of lifelong learning for autonomous vehicles learning problems, particularly monocular depth estimation, and improved performance by 3% using unsupervised domain adaptation and 5% using rehearsal based lifelong learning.

**Video Processing and Understanding Lab** Jun 2019 - Aug 2019
*Research Intern* *Madrid, Spain*

· Developed a multi-projection variant of YOLO detector and a tool for the automatic generation of ground-truth data for object detection of Google Street View images.

**Addis Ababa University** Sep 2017 - Sep 2018
*Assistant Lecturer* *Addis Ababa, Ethiopia*

· Developed own teaching materials, methods and approaches taking into account established or agreed on practices.

## HONORS AND AWARDS

| | |
|---|---|
| Google CS Research Mentorship Program Scholar | *2021* |
| Erasmus+, Erasmus Mundus Joint Master Scholarship (EUR 49,000) | *2018 - 2020* |
| Best Bachelor Thesis Award, Addis Ababa University | *2017* |
| Very Great Distinction, Dux of College of Natural Sciences, Addis Ababa University | *2017* |

## TECHNICAL STRENGTHS

| | |
|---|---|
| **Languages** | Python, C/C++, Matlab, Java, C# |
| **Libraries** | Pytorch, Tensorflow, Keras, Scipy, sklearn, OpenCV, OpenGL, PCL |
| **Tools** | LaTeX, git, Unity3D, Blender, Xilinx |

## PROJECTS

**Lifelong Learning for Autonomous Vehicles** *Feb 2020 - July 2020*
Proposed and developed a self-supervised and a confidence-guided depth supervised domain adaptation technique. Developed a mixture of standard- and pseudo- rehearsal approaches that rely on the basis of rehearsing past knowledge with a replay mechanism to prevent catastrophic forgetting

**Object Detection in Equirectangular Panorama** *Jun 2019 - Sep 2019*
Developed a tool for the automatic generation of ground-truth labeling for object detection of Google Street View images and proposed a multi-projection variant of YOLO detector for Equirectangular Panorama.

**3D Shape Prediction from single RGB image based on Deep Learning** *Feb 2019 – Feb 2020*
Developed a deep learning technique that infers 3D shape from single RGB image by incorporating prior cues.

**Ethiopian Sign Language to Amharic Text Translator** *Jan 2018 – Jun 2018*
Developed Ethiopian sign language to Amharic text translation system that converts a gesture into its corresponding Ethiopian Sign Language and displays an equivalent Amharic text.

**Automated Optical Mark Reader** *Sep 2017 – Jan 2018*
Developed an automated optical mark reader built for Ethiopian National Educational Assessment and Examinations Agency's national examinations

**Intelligent Traffic Management System** *Mar 2015 – Jul 2017*
An autonomous and an intelligent traffic management system that can dynamically allot traffic signal time based on density, track vehicles, recognize license plates and estimate their speed, manage smart parking, and provide real-time incident notifications.

- Awarded as the innovative project of the year by Addis Ababa University and YeBen Endowment Fund

**Office Collaboration Suite** *Sep 2016 – Mar 2016*
A desktop application that help colleagues of an office communicate easily. Some of its features are virtual notice board, chat, video chat, video conferencing, to-do list management, and file sharing.

**eBrana – online bookstore** *Sep 2014 – Feb 2015*
A web application that provides an opportunity for writers to self publish books on an online store. Books are digitized to a highly secure e-book format with 'copy and content protection', readers having privileges to the degree that the authors permit. When consumers buy a book from this store, they get a protected e-book file and a single security code. The copy protection includes preventing users from printing, copying and pasting, taking screen print, and the e-book shall only work on a single device with a single security code.