Availability of Datasets for AI Research in Africa and a way forward

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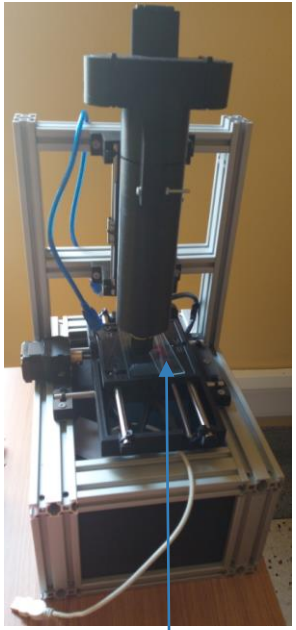
Experiences from the Past Experiments/Research

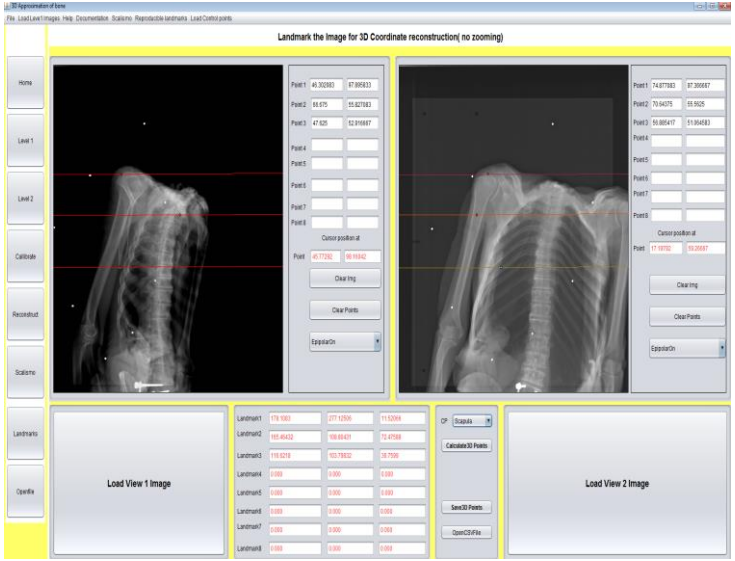
PapES Innovation



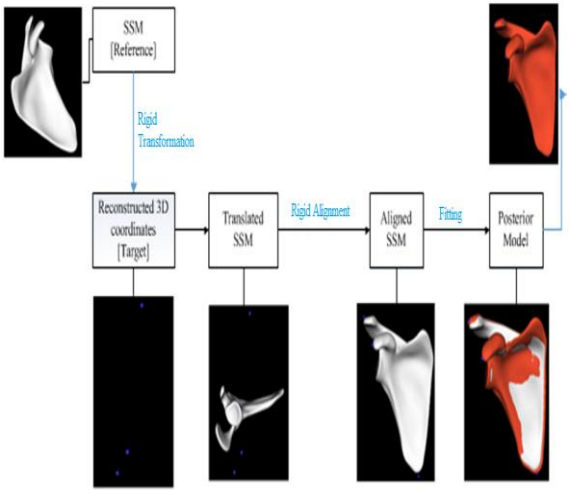
(i) a low-cost digital microscope sliding scanner, (ii) cervical cancer risk factors evaluation engine, and (iii) a pap-smear analysis tool.

Experiences from the Past Experiments/Research

3DReconstruction



3D reconstruction of patient specific human Scapula from 2D X-ray images; towards patient specific low cost implant designs:

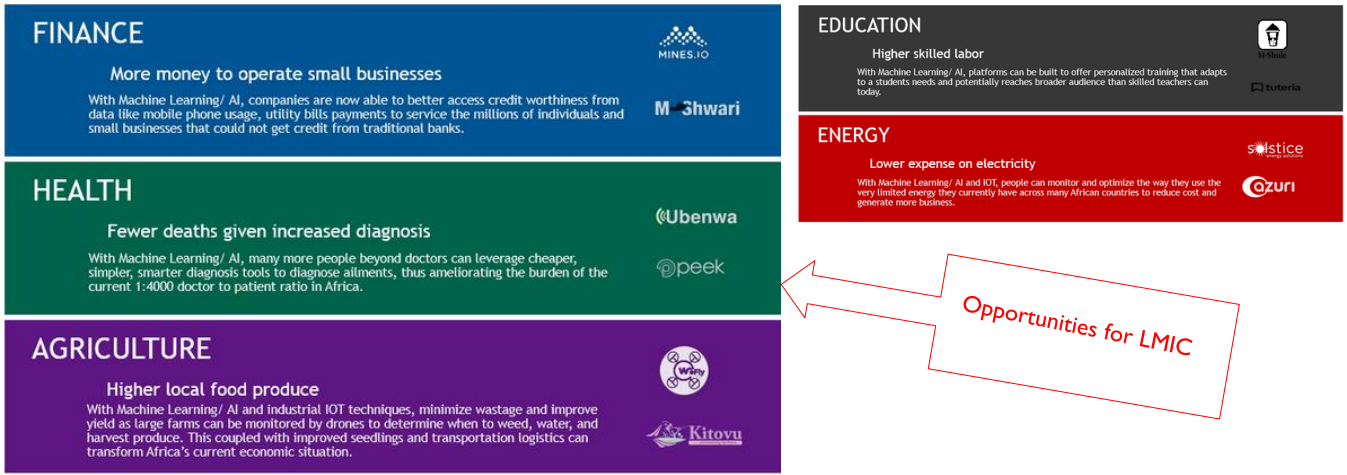


Landmark Constrained Statistical Shape Model Fitting

AI Research in Africa

Introduction

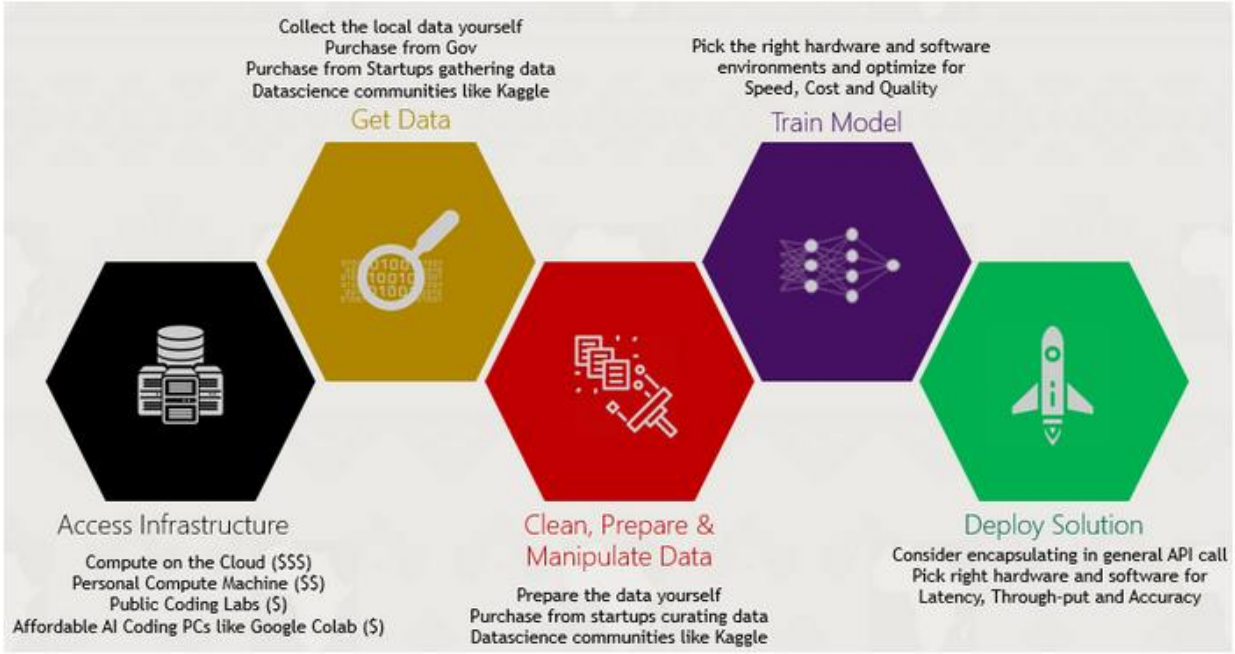
- Most **impactful AI** research is not happening in Silicon Valley.
  - Self driving cars Vs **Pap-smear Image Analysis, Malaria Diagnosis**
- Opportunities in Africa to fill gaps in:



AI Research in Africa

Datasets

- However, **Reliable** Datasets are typically smaller in Africa
- But are more accessible.



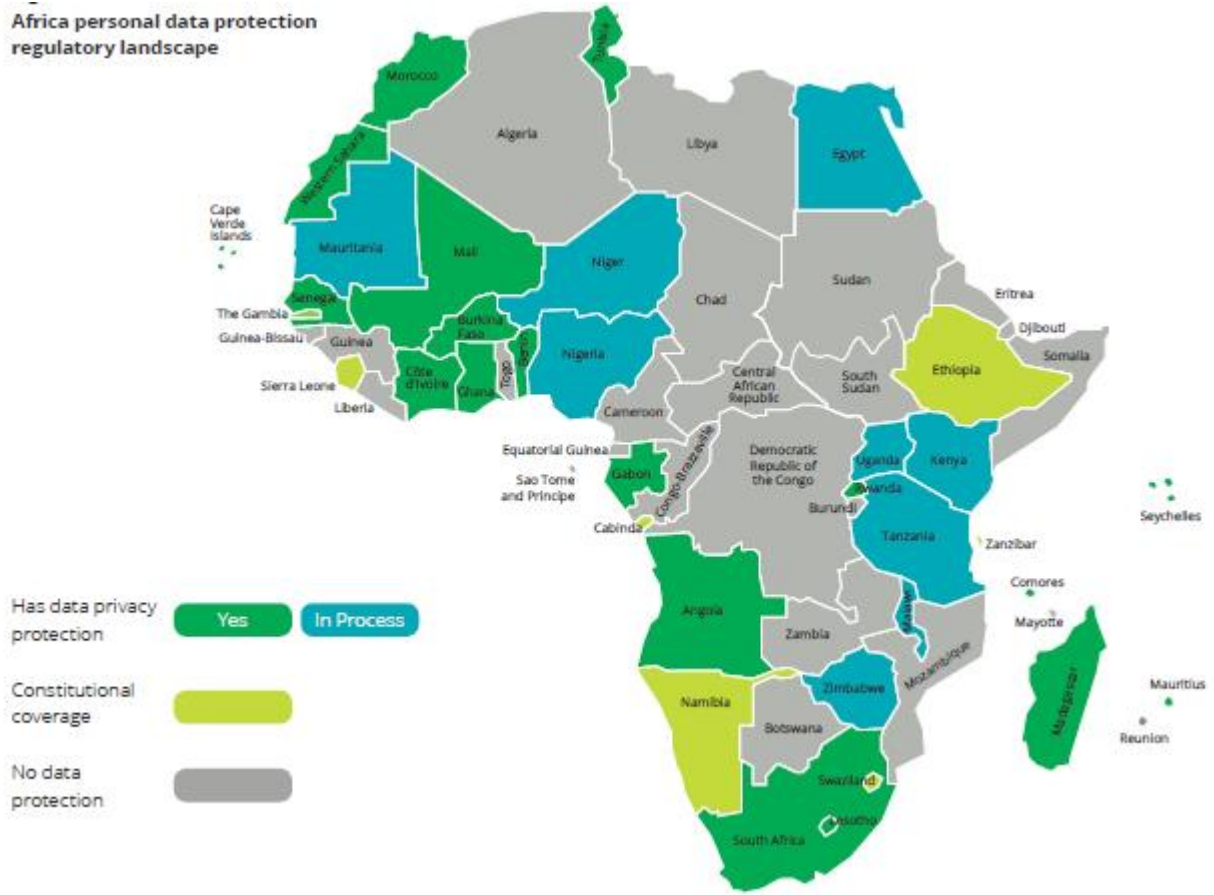
AI Research in Africa

Datasets

- Unlike in US and UK, where data protection laws are installed to protect individual privacy complicate, these are few in Africa
  - In Uganda, Data Protection and Privacy Act, 2019
  - In South Africa, The Protection of Personal Information Act, 2014 (POPIA); the use and processing of personal information.

AI Research in Africa

Data Protection Laws of Africa



Source: Privacy is Paramount, Personal Data Protection in Africa, Deloitte, 2017

AI Research in Africa

The Challenge

- Major AI Advances have been fuelled by advances in **Datasets**
  - Apps providing driving directions
- However collecting, classifying and labeling datasets used to train the algorithms is the grunt work that is difficult
  - **Datasets comprehensive enough to reflect real world**
- Many companies/researchers do not realise the importance of good data until they have started their AI projects
  - **My own experience**
    - Moving from proof of concept and pilot to a production system
  - **Testimonies**
    - from developers from a number of computing firms

The Challenge

AI Research in Africa

- There is still limited Expertise in AI in Africa
  - eResearch Africa
  - Data Science Africa
  - Few universities offer masters degree in AI
    - In Uganda, only 1/7 public universities.
- Limited Adoption of Information Systems in Africa
  - Hospitals
  - Business
  - Manufacturing
- Closed Standalone Systems
  - Who pays for Public Access?
  - Limited APIs
- A lot of open dataset NOT from Africa's population
  - http://machineintelligenceafrica.org/resources/machine-intelligence/data-sets/

AI Research in Africa

The Challenge

- For Disease Diagnosis
  - Lack of disease specific datasets for AI research
    - Malaria, Cancer, etc.
  - Specific body part images
    - X-rays, CT scans.
  - Natural Language processing
    - Limited datasets for African Languages
  - Open Access Registries
    - A lot of feature selection required
- Prediction
  - Limited datasets and History
  - Limited Expertise in Biomedical Data science

AI Research in Africa

Wayforward

- Need to skill Africans with emerging AI techniques
  - Not Only, Academia
    - BUT also private sector (computing firms)
    - Health professionals
      - What AI can do for them..
  - Free Easily Accessible Online Courses
    - In Addition to
      - Coursera
      - Data Science Africa
  - More competitions
    - Kaggle
      - Africa specific health challenges

AI Research in Africa

Wayforward

- A need for **independent auditing** of machine learning models
  - A number of free open Apps especially for Diagnosis
- **Empower Africans** to build AI models for the existing challenges
  - A model built with right data, right algorithms may fail to work in a different setting.
- General education curriculum need to prioritise the cultivation of AI skills to students
  - Currently, AI common to University (**Masters, PhDs**)
- Setting up of Centres of Excellence in Machine Learning
  - **Innovation Hubs with infrastructure to support AI**
  - Gov. to support Open Data initiatives
  - AI labs in Universities

AI Research in Africa

Wayforward

- Strengthen patternships and collaborations
  - African and other international academic institutions
    - Data sharing for training AI models
    - Expertise
  - Academic institutions and the private sector

- Finally More AI for Health Networking Events
  - Identify challenges
  - Meet people working on similar projects
    - **Thanks to ITU and WHO**

Thank you for Your Time

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