Carnegie Mellon University

Progress Report 1

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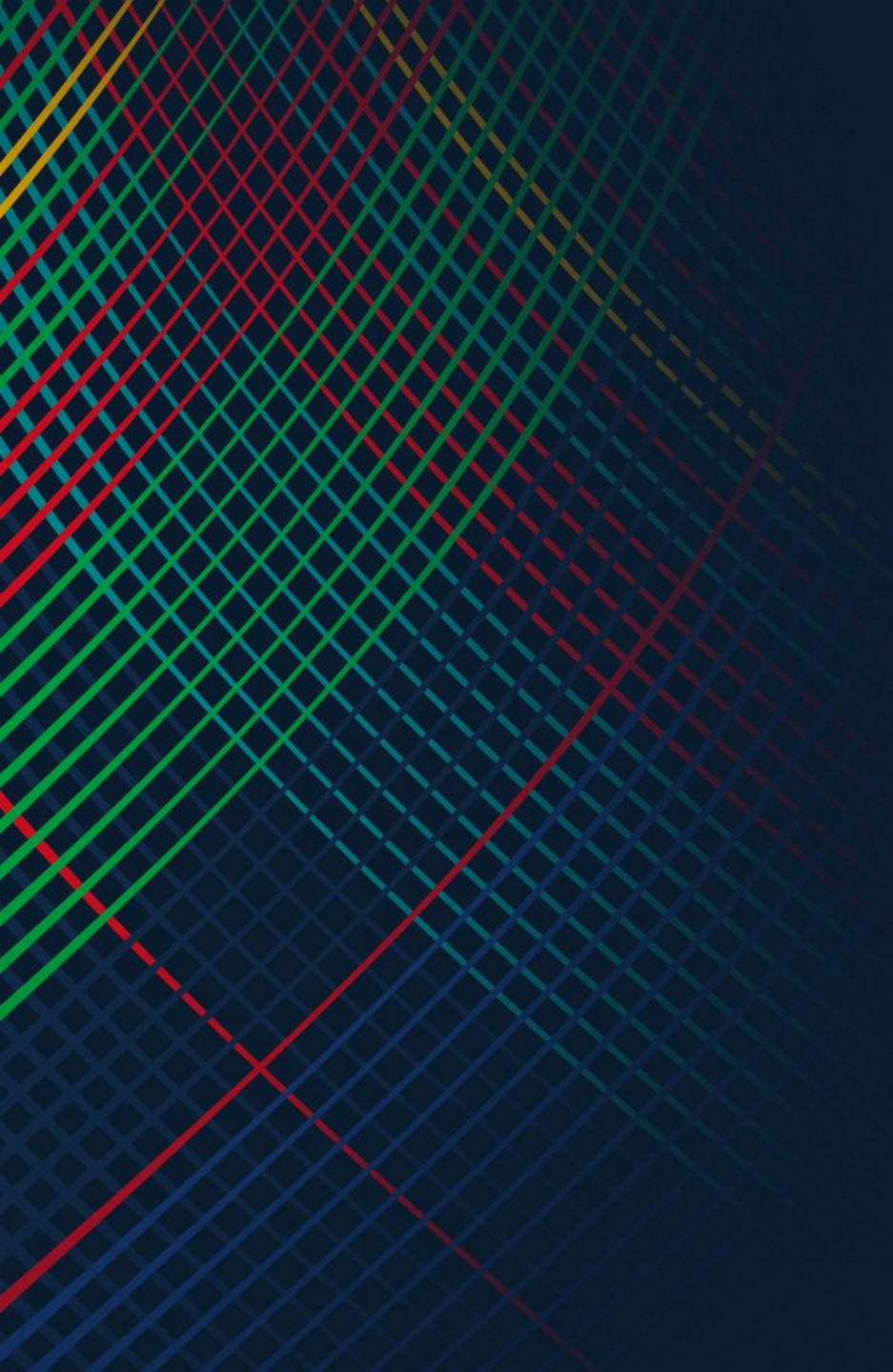
Agenda

1. Introductions
2. Project Scope and Objectives
3. Team Methodology
4. Major Deliverables and Tasks Timeline
5. Risks and Mitigation



Introductions

CMU Student Team: Researchers

Isaac Manzi

CMU Africa – MSIT Program

Esther Kamau

CMU Africa – MSIT Program

Blaise Viateur Niyigena

CMU Africa – MSIT Program

Pasqua Ruggiero

CMU Pittsburgh – MSP Program

CMU Student Team Advisor: Dr. Assane Gueye

Profession: Assistant Professor at CMU Africa

Research Interests:

- Cybersecurity
- Connectivity in Rural and Under-Served Areas
- Machine Learning and Artificial Intelligence

Client: Dr. Amreesh Phokeer

Profession: Research Manager at AFRINIC

Research Interests:

- Interdomain routing
- Network Security
- Internet Measurements
- Software Design

Project Scope and Objectives

Background

- AFRINIC(Regional Internet Registry for Africa) – allocate internet number resources to network providers
- MIRA(Measuring Internet Resiliency in Africa) – survey current state of Internet in African countries and measure internet infrastructure resiliency
- Need of proper metric aggregation method that represents country's internet resiliency

Objectives

1. Identify relevant metrics to rank network resilience among different spatial extents of Africa
2. Create aggregate index representation of resilience metrics
3. Set up ETL pipeline to facilitate re-calibration process of model parameters
4. Create visualization to display aggregate index to stakeholders and end users

Major Deliverables and Tasks Timelines

Theoretical Framework (February – Mid March)

1. Identify metrics that encompass overall level of resilience
2. Determine methodology to aggregate selected metrics
3. Extract and process data
4. Utilize statistical methods and SME opinions to assign weights for each metric

ETL Pipeline (Mid March – Early April)

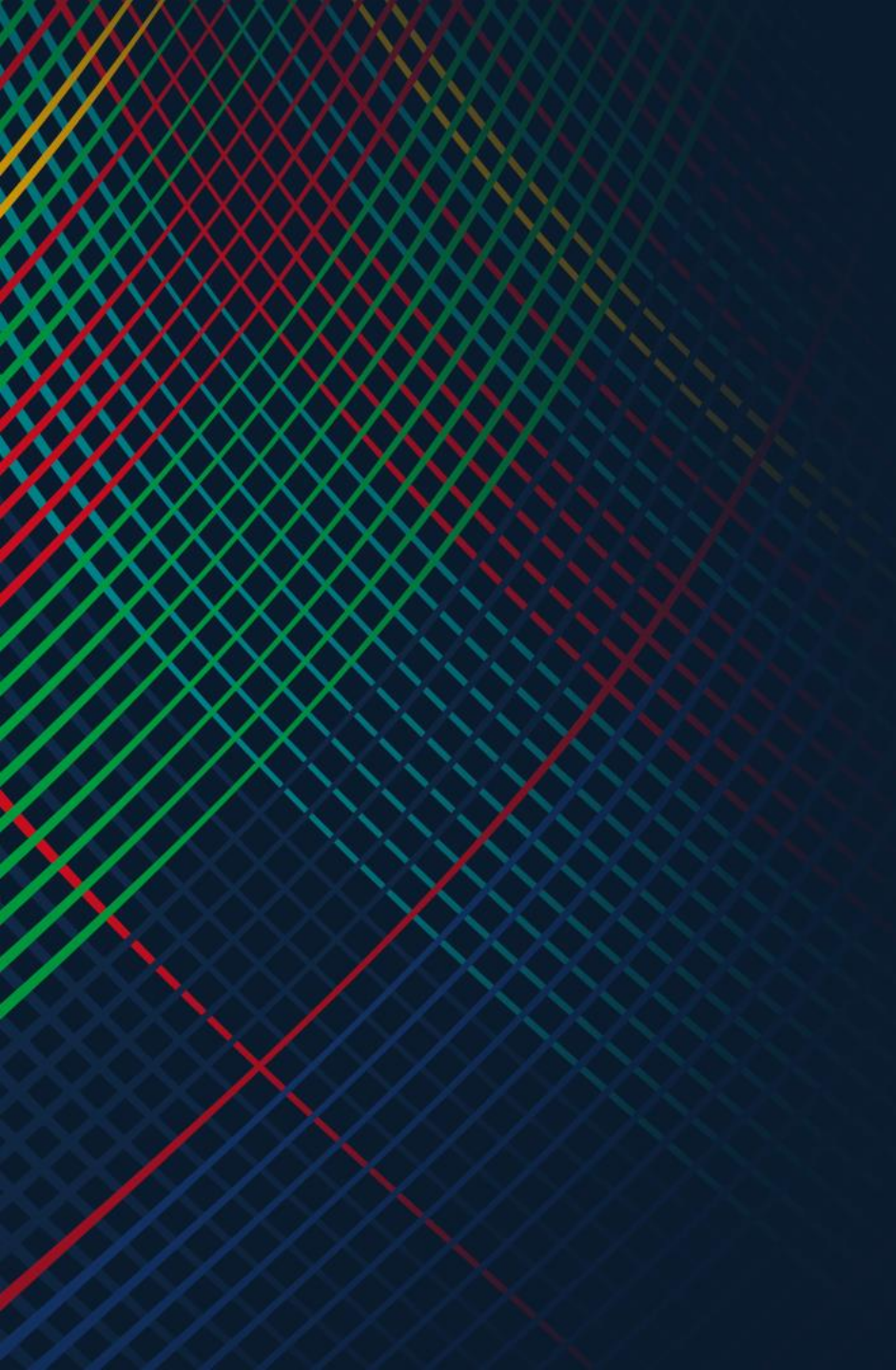
1. Automate data extraction from all sources
2. Data transformation pipeline to process data for analysis for weight determination
3. Create scheduling task to execute above

Data Visualization (April)

1. Create dashboard display African regions' internet resiliency score
2. Deploy dashboard on AFRINIC site

Written Final Deliverables (Late April - Early May)

1. Create final presentation and present to client, classmates, advisors and lecturers
2. Complete documentation of all methodologies used
3. Prepare final report of processes and results



Risks and Mitigation

Risk 1: Globality of Team

1. Utilizing shared virtual spaces to highest capacity - Google Drive, GitHub
2. Hosting 2 regularly scheduled meetings per week for student team
3. Hosting 1 regularly scheduled meeting per week with advisor and client
4. Communicating immediate needs through social media spaces - Slack, WhatsApp

Risk 2: Limited Time to Complete Project

1. Create project timeline highlighting all phases and associated tasks
2. Set expectations on final deliverables and process as early as possible
3. Leverage differing data science, software development and networking experience to evenly distribute tasks and facilitate learning and mentorship

Risk 3: External Data Procurement

1. Performing literature review as soon as possible to gauge most relevant metrics
2. Evenly and efficiently assigning preprocessing tasks

Risk 4: Insufficient Data

1. Extensively research metrics included in aggregate index
2. Document required data and data availability

Questions

If any questions arise, please direct them to the following:

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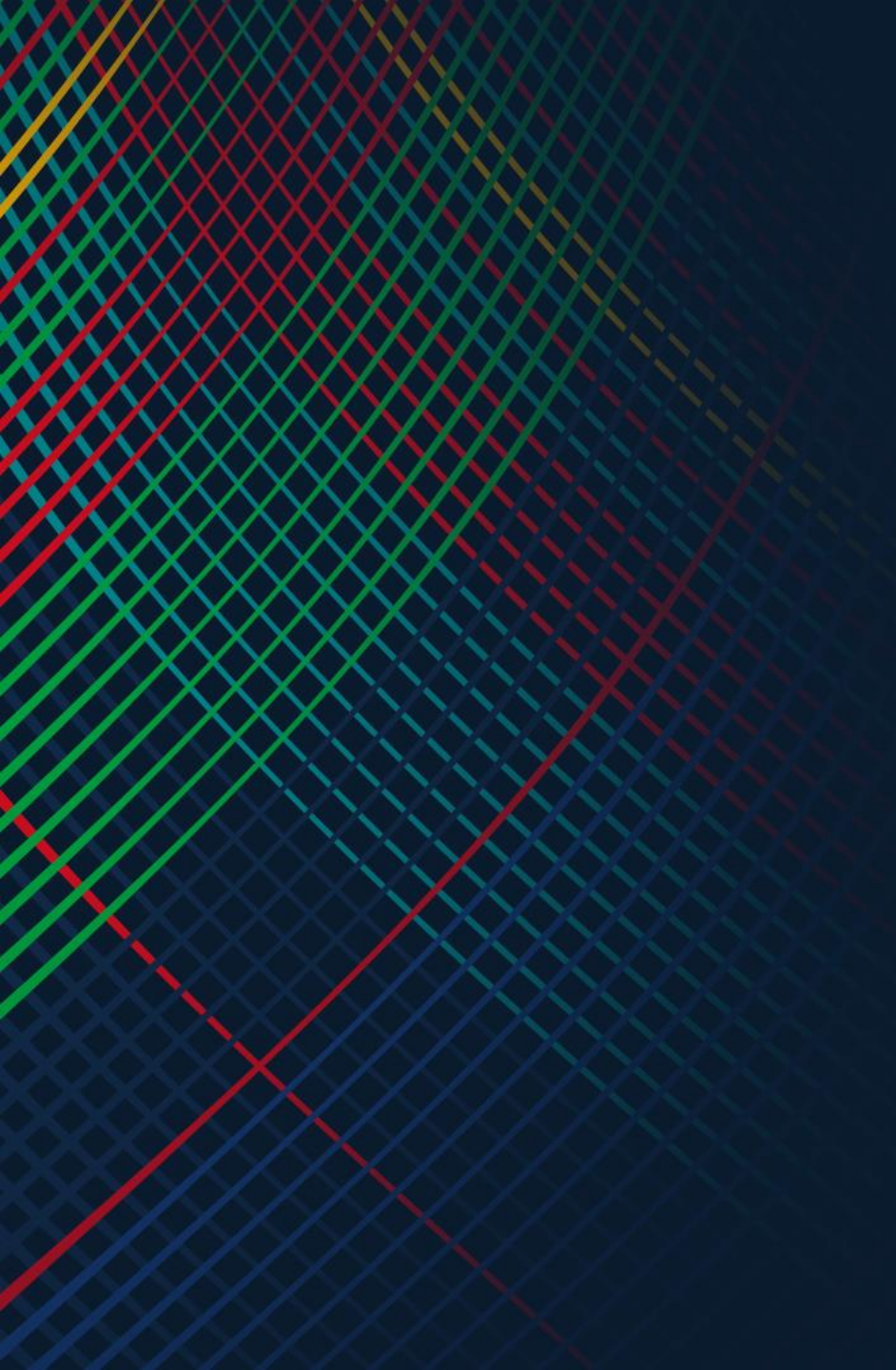
Dr. Amreesh Phokeer: amreesh@afrinic.edu



Thank you!