



OPTIMA Network Measurement Training Guide

This guide outlines general information for participation in the course and includes a detailed agenda for each week of the course.

Please reach out to Ben (bwwhitehead@internews.org) with any questions!



Using Network Measurement in Advocacy

Through this 6-week hands-on training, participants from Sub-Saharan Africa will collect, analyze, and document open source internet measurement tools and datasets, and learn how to use what they've learned to strengthen their own advocacy efforts against internet shutdowns.

This course is intended to provide an introduction on how to use open source internet measurement tools and datasets to human rights advocates in Sub-Saharan Africa who are working on initiatives to end or prevent internet shutdowns in their countries. Through the training, participants will get an overview of these tools and datasets, learn how to collect and analyze their own data, discuss case studies of how advocates have used measurement data to document shutdowns, and get one-on-one time with trainers to build research plans on how to incorporate some of these methods into their advocacy.

For each of the six modules, participants will be asked to watch a pre-recorded training video followed by another hour for a live session with the module lead. In advance of each module, participants should review core course materials, including any relevant resources included in the weekly packet to be sent before each session*. Following each module, participants will participate in a practical scenario-based assignment to test their knowledge of that week's course. Assignments are to be completed within the week following each module, and session leaders will be available to answer questions throughout the week.

*Participants will receive a brief informational packet on the upcoming session, including the session title, description, link, presenter bio, and homework assignment. Those packets will also include relevant resources, as well as the homework assignment.

Modules will be presented on a weekly basis over the course of this six-week training. The training will run from Tuesday, October 13th through the week of November 16th. All participants will attend both the recorded and live sessions each Tuesday from 13:30 to 16:00 UTC (14:30 – 17:00 WAT; 15:30 – 18:00 CAT; 16:30 – 19:00 EAT).

This guide includes most of the key relevant information to support participation in this training.

Key Information

How to join:

All trainings modules will be hosted on Zoom. The link to join each Tuesday is <https://internews.zoom.us/my/networkmeasurementtraining>.

Attendance and Certification:

As a participant of this course, you are expected to attend all six training sessions and complete the associated homework assignments. Upon completing the six-week course, you will receive a certificate demonstrating your attendance and understanding of the modules covered during the training.

If you cannot attend a session, please let me (Ben), as well as your team, know. You will be expected to coordinate with them on what content you missed during the live session and should (when possible) watch the recorded training and complete the homework assignment. If you miss two or more trainings and do not catch up on the content on your own, you may be ineligible to receive the final certification and/or barred from continuing with the course.

At the start of each session, we will take note of attendance to ensure that we have everyone present.

Homework assignments:

Throughout the training you will be responsible for completing the following:

- You will be given a weekly individual assignment related to the content of that week's module. Each weekly assignment must be completed by the Sunday before the following week. All session leads have allotted "office hours" throughout the week to answer any questions you have as you complete these.
- You will also develop a group research question/proposal. You do not have to actually answer the research question during this course, but instead each group will build a proposal on how you would go about doing research and advocacy based on your proposed research question. Your group will work with the mentors to begin to collect and analyze data towards answering these research questions. These research/advocacy proposals should draw on the methods, tools, and datasets that you will learn about throughout the course.

During the final week of the training, your group will be expected to do a 10-minute presentation on your longer-term group project. Those presentation should include the following:

- Your main research question and sub-questions
- Background of the issue and why it is relevant (the “so what” question)
- The methods you used (highlighting course learnings when possible)
- Potential next steps

Stipends:

In order to support your attendance throughout this training, Internews can offer a \$100 stipend upon request. If you would like this participation allowance, please reach out to Ben on Slack or email at bwhitehead@internews.org

Groups:

You have been placed into a small group of 2 or 3 people, which you will be in for the entire training. We created each group based on the information each of you provided in your application. Each group has a unique theme that unites you—for some it’s a particular country (eg, shutdowns in Cameroon), for others it’s a specific type of topic (eg, economic impacts of shutdowns). We’ve also tried to mix up the groups so that each person has a slightly different type of expertise than others in the group. Someone might have more experience with network measurement tools, while another person might have more advocacy expertise, and someone else might have qualitative research experience.

Slack:

We have created a Slack workspace for you to talk and collaborate with your small groups, other participants in other groups, the Internews team, and the mentors. You all should have received an invite to Slack in your email. When you join, you will automatically be included in a channel with the other members of your group. Use your groups workspace to discuss and chat about your group research. We will also be sending updates via Slack (and email), so please make sure to check the general channels as well.

Ben, Haley and Laura from Internews- as well as the measurement mentors - will be available on Slack to answer questions that you might have please feel free to message them there and they will get back to you as soon as they can.

To learn more about how to use Slack, watch this [brief tutorial!](#)

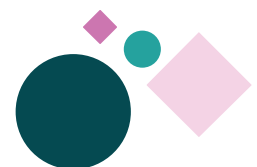
Code of Conduct:







All participants of this training are required to understand and sign Internews’ [code of conduct](#)

Training week

During each week of the six-week training we will cover a different topic. Each week will consist of the following schedule:

| Preparation | Tuesday | Post-session |
|--|--|---|
| <p>Pre-reads Review any pre-reads for the week’s sessions and make note of any questions that you might have.</p> | <p><u>13:30 UTC</u> Join the Zoom link to join the pre-meeting conversation.</p> <p><u>13:30 – 14:30</u> On your own, please watch the pre-recorded session that will be provided.</p> <p><u>14:30 – 15:30</u> Participate in live session</p> <p><u>15:30 UTC</u> Close</p> | <p>Guest speakers to be announced week to week.</p> <p>Group coordination Set up a time to touch base with your research group to coordinate.</p> <p>Homework You and your team will be expected to complete and submit your assignment by Sunday before the next session</p> <p>Office Hours Attend mentor’s “office hours” to ask questions on the content or the assignment</p> |



| Week | Date | | Module |
|------|-------------|---|--|
| 1 | October 13 |  | Introduction to Network Measurement with OONI |
| 2 | October 20 |  | Documenting Blackouts with IODA |
| | October 22 | Guest speaker | ISP Ownership and the Implications for Shutdowns in Africa |
| 3 | October 27 |  | Detecting Blocking of Websites and Applications with OONI |
| | October 29 | Guest speaker | Documenting Network Interference in Venezuela |
| 4 | November 03 |  | Measuring Internet Performance with MLab |
| | November 05 | Guest speaker | Tracking Facebook throttling in Jordan |
| 5 | November 10 |  | Contextualizing Your Data with Bachchao Project |
| | November 12 | Guest speaker | Conducting Shutdown Research in Cameroon with UPenn |
| 6 | November 17 |  | Using measurements in Advocacy with AccessNow |
| | November 18 | Guest speaker | Tracking shutdowns and applying research in India with SFLC.in |

Week 1: Introduction to Network Measurement

Maria Xynou, OONI

Tuesday, October 13

This session will provide an overview to Internet measurement, with focus on the tools, projects and datasets which can be used to uncover evidence of information controls. We will examine some of the common questions that researchers and advocates may have that can be answered through network measurements, what limitations each dataset can have and the different methods. The primer will also present the risks inherent in conducting internet measurement research within restrictive contexts.

[Click here to watch the recorded session](#)

[Visit OONI's website to learn more](#)

About the presenter



Maria Xynou works with the Open Observatory of Network Interference (OOONI) where she manages partnerships and community research on internet censorship around the world. Previously, she worked with the Tactical Technology Collective where she investigated the data industry, created digital security resources, and facilitated digital security workshops for human rights defenders. She also worked with India's Centre for Internet and Society where she investigated surveillance schemes and technologies and interned with Privacy International. Maria holds a MSc in Security Studies from the University College London (UCL)

Pre-reads/resources

[OPTIONAL Advance Reading – Introduction to Network Measurement](#)

Weekly Individual Assignment

Come up with a question you think could be answered through network measurement, determine which platform(s) might be able to answer that question and proceed to attempt to answer the question with the data.

Successful completion of the assignment does not necessarily require answering the question through the data but ensuring that you have understood where to look.

Group Assignment

With your group, develop a draft research question on your topic. Be prepared to discuss your question with Maria during this week's office hours where she can help refine and provide feedback.

Office Hours

I am available for office hours on Friday, 16th October 2020. You can use this time to ask questions on your research topic, discuss the webinar, or learn more about how to use OONI tools. Reach out to me (Maria) on Slack to arrange a conversation during one of the following time slots.

- Slot 1: 10am - 11am UTC
- Slot 2: 2pm - 3pm UTC
- Slot 3: 3:30pm - 4:30pm UTC



Guest Speaker: Internet Disruptions in Sudan

Khattab Hamad

Khattab, an engineer and digital rights advocate working for a telecom company in Sudan, outlines the recent internet shutdowns in Sudan and explains how he, as an advocate equipped with data, confronted this challenge. By illustrating real-world examples of data collection during network disruptions, Khattab demonstrates that empirical data is a necessary tool to support informed advocacy efforts.

Week 2: Documenting Blackouts

Rama, IODA

Tuesday, October 20

This session will serve as a primer on how to use IODA's tools to detect when mobile and/or fixed internet access has been cut off at the national or subnational level.

[Click here to watch the recorded session](#)

[Click here to learn more on IODA's website](#)

About the presenter



Alberto is a Research Scientist at CAIDA, the Center for Applied Internet Data Analysis, which is part of the San Diego Supercomputer Center at University of California San Diego, USA. In 2008 he received his Ph.D. in Computer Engineering and Systems at University of Napoli "Federico II", Italy. Most of his research is at the intersection of Internet security and Internet measurement and data analysis.



Rama is a Postdoctoral Scholar with CAIDA working on the IODA project. He performs research on methodologies to detect Internet connectivity outages, in near real time, through active and passive measurements.

Weekly Individual Assignment

1. Use IODA to explore historical outages in a country of your choice
 - Choose any country and select a time-period
 - Investigate country-level, region-level, AS-level outages using IODA
2. Use IODA to analyze the April 2019 shutdown event in Benin
 - In April 2019, an election-related government-mandated shutdown occurred in Benin
 - Analyze outages related to this event at the country-level, region-level, and AS-level using IODA

Group Assignment

Work as a group to review existing research, reports, and available data that is relevant to your research project to build a short (2-3 page) 'background information' paper to provide an overview on what research exists on your subject and why additional research and data collection is necessary. You can use [this template](#) to ask questions to collect information to write this background information paper. We will also be providing feedback on your first assignment next Wednesday in order to help you find resources for this assignment.

Office Hours

- Wednesday, October 21: 15:00 – 16:00 UTC
- Thursday, October 22: 15:00 – 16:00 UTC
- Friday, October 23: 15:00 – 16:00 UTC



Guest Speaker: ISP Ownership and the Implications for Shutdowns in Africa

Lisa Garbe, University of St. Gallen

As part of an ongoing research project, Lisa Garbe and her team of researchers at the University of St. Gallen in Switzerland have gathered data on all internet service providers (ISP) in SSA as well as their shareholders. Through this research, they seek to analyze whether ISPs with different shareholders react differently when faced with a government request to block internet access. Furthermore, they try to highlight the responsibility of corporate actors involved in blocking access to internet services.

Week 3: Detecting Blocking of Websites and Applications

Maria Xynou, OONI

Tuesday, October 27

This session will serve as a primer on how to use OONI's tools to detect the blocking of websites, instant messaging apps, and censorship circumvention tools. This session will also discuss how you can use OONI network measurement data to uncover evidence of internet censorship.

[Click here to watch the recorded session](#)

[Visit OONI's website to learn more](#)

About the presenter



Maria Xynou works with the Open Observatory of Network Interference (OOONI) where she manages partnerships and community research on internet censorship around the world. Previously, she worked with the Tactical Technology Collective where she investigated the data industry, created digital security resources, and facilitated digital security workshops for human rights defenders. She also worked with India's Centre for Internet and Society where she investigated surveillance schemes and technologies and interned with Privacy International. Maria holds a MSc in Security Studies from the University College London (UCL)

Individual Assignment

Install the OONI Probe Mobile app and run tests

- What do the test results tell you?
- How would you test websites of your choice?

Create an OONI Run link based on websites that you would like to see tested and share that link with other OONI Probe mobile app users (so that they can test the websites of your choice).

Access OONI Explorer and filter the measurements based on your country

- How would you find the most recently tested websites?
- How would you find the most recent Facebook Messenger test results?

- How would you find the most recent WhatsApp test results?
- How would you find the websites that are likely blocked?

Group Assignment

Real-world scenarios

- Its election day and you cannot access facebook.com, Instagram.com, and twitter.com. What would you do to check if they are blocked? Describe each step of the process.
- Social media is reportedly blocked in your country. What would you do to check if they are in fact blocked? Describe each step of the process.
- Access to specific news websites is reportedly blocked in another country. What would you do to check if those websites are blocked?

Office Hours

Maria is available for office hours on Friday, 30th October 2020 during the following slots:

- Slot 1: 11am -12pm UTC
- Slot 2: 3pm - 4pm UTC
- Slot 3: 4:30pm - 5:30pm UTC



Guest Speaker: Documenting Network Interference in Venezuela

Andres Azpurura, VeSinFiltro

Andres is Venezuela's leading expert on measuring and reporting of censorship events in the country. During this session, Andres outlines his extensive experience using OONI tools and OONI data to investigate and expose internet censorship in Venezuela. He is a technologist by training and has built some of his own custom tools based on the OONI probe. Through real-world scenarios, Andres provides concrete examples of how and when OONI tools are useful during a network disruption and offered tips as to how to most effectively use the data that you collect.

Week 4: Measuring Internet Performance

Lai Yi Ohlsen, M-Lab

Chris Ritzo, M-Lab

Tuesday, November 03

This session will serve as a primer on how to measure internet performance, speeds, and will provide a discussion on how governments are able to “throttle” internet speeds and some of the challenges with measuring throttling.

[Click here to watch the recorded session](#)

[Visit M-Lab’s website to learn more](#)

About the presenters

Lai Yi Ohlsen is an artist and tech worker operating at the intersection of measurement, media and movement. She is the Project Director of Measurement Lab, one of Code for Science Society’s sponsored projects. Previously, she worked to defend and promote human rights online with eQualitie as Technical Programs Manager.



Chris Ritzo is the Program Management & Community Lead for Measurement Lab, where he supports researchers, policy makers, advocacy groups, and individuals interested in M-Lab’s open Internet measurement data. Chris is a librarian and technologist whose research examines technology’s impact on and use within communities, particularly within public institutions such as schools and libraries.

Pre-Reads/Resources

[Advance Reading – Measuring Internet Performance](#)

Individual Assignment

Using NDT test data to examine internet performance

(This is an individual assignment, but use countries that are relevant to your group’s project if possible- and you are welcome to discuss your findings as a team)

Compare two or more regions' internet performance using NDT test data over a set amount of time.

- What countries or regions are you interested in?
- Are there specific dates when an internet shutdown or censorship event occurred in that area?
- What would M-Lab's NDT measurements show at that time in that location?

(Optional) Construct a query to investigate the internet performance in a specific region during a specific time (Ex. During COVID-19 or during a one-day nationwide event)

(Optional) Use NDT data to examine their understanding of "rural" vs "urban" areas in their region of interest.

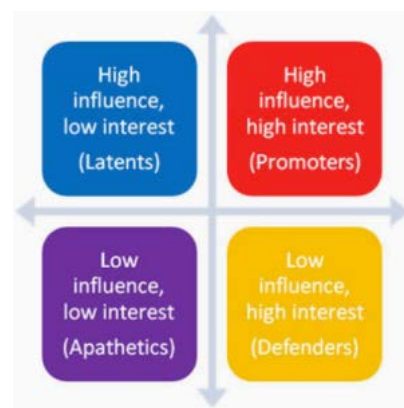
Group Assignment

Stakeholder analysis

For this assignment, we want you to work in your group to determine who the 'stakeholders' are as it pertains to internet shutdowns and your research question. When we say stakeholders, we are referring to people, groups, or organizations that are directly or indirectly affected by the outcome of a shutdown or affect the outcome. For example, watching Lisa Garbe's presentation you learned (and probably already knew) that ISPs are very important stakeholders when it comes to internet shutdowns because they both affect the outcome and are affected by the outcome. Different government bodies (Executive, regulatory, legislative, judicial, etc.) and citizen populations (specific regional, linguistic, or demographic groups) are also stakeholders.

Once you have a comprehensive list of stakeholders, we want you to brainstorm as a group to answer the following questions for each stakeholder:

- What is this stakeholder's stance on the issue of internet shutdowns?
- What are the incentives they have for taking this position & what is the logic behind this choice?
- What is the importance or visibility of this stakeholder and how powerful are they to impact internet shutdowns?
- How interested are they in impacting the outcome (either to shutdown the internet or to prevent a shutdown)?



Then, we ask that you map all the stakeholders on this influence/interest matrix:

(for questions on this assignment, reach out to Laura!)

Office Hours

Chris and Lai Yi are available for office hours on Thursday, 5th November 2020 during the following slots:

- Slot 1: 2:00pm -3:00pm UTC
- Slot 2: 3:00pm – 4:00pm UTC
- Slot 3: 4:00pm - 5:00pm UTC



Guest Speaker: Tracking Facebook throttling in Jordan

Issa Mahasneh, JOSA

During this session, Issa, a digital rights advocate and technologist at the Jordan Open Source Association (JOSA), walks through how he and his colleagues detected Facebook Live throttling during nationwide protests in Jordan, and what that data meant for their own advocacy efforts. By focusing on targeted slowdowns, Issa touches upon a growing (and concerning) trend across the world for governments to disrupt connections without blanket shutdowns.

Week 5: Contextualizing Your Data: Using Local Insights and Qualitative Research

Chinmayi SK

Tuesday, November 10

This session will show how you can use other research methods to contextualize technical data in order to verify analysis and better understand user impact and experience. This session will provide an overview on other methods that are useful to supplement technical measurement as well as case studies that draw on mixed-methods to document network interference.

[Click here to watch the recorded session](#)

[Visit Bachchao's website to learn more](#)

About the presenter



Chinmayi is a technology and researcher based out of India. She is the founder of the techno-feminist collective called "The Bachchao Project" which works to support communities and organisations working on women and LGBTQIA issues.

Pre-Reads/Resources

[Optional: Of Sieges and Shutdowns \[Summary\]](#)

Individual Assignment

Research on Marginalized Groups

[This is an individual assignment, but you can use a population that is relevant to your group's project if possible- and you are welcome to discuss your findings as a team]

Create a research question focused on how internet shutdowns impact a particular population. Choose a research method (or several methods) you would employ to explore this research question and list the reasons why this would be the best approach. What are some ethical considerations you should consider for your target

population and the research methods you are choosing to use? Is there a need for any additional methods to support your study? How could you combine this research with network measurement data?

Group Assignment

Choosing Your Research Methods (Group Assignment)

Now that you have learned about IODA, OONI, NDT, as well as how social science methods can be combined with network measurement methods to answer research questions, please work with your group to build your research plan to outline what methods you will use to collect and analyze data that will help you answer your research question.

Office Hours

Chinmayi will be available for the following office hours:

- Thursday, November 12 at 14:00 UTC
- Friday, November 13 at 14:00 UTC
- Monday, November 16 at 14:00 UTC



Guest Speaker: Conducting Shutdown Research in Cameroon

Florence Madenga, UPenn

Flo, a student and researcher at the University of Pennsylvania's Annenberg School, walks through her experience using various research methods to better understand the Cameroon context in relation to the 2017-2018 Internet shutdown in the country. She highlights certain best practices for operating in low bandwidth environments, and highlights the importance of qualitative and quantitative research methods to support informed advocacy efforts.

Week 6: Using Measurement in Advocacy

Berhan Taye, Access Now

Tuesday, November 17

This session will offer best practices in using measurement research within advocacy campaigns related to internet disruptions and access.

[Click here to watch the recorded session](#)

[Visit AccessNow to learn more](#)

About the presenter



Berhan Taye is a social justice activist, a peace studies practitioner, and an avid advocate for the open web. Berhan leads Access Now's work on digital rights in Africa as the Africa Policy Manager. As the Global Internet Shutdowns Lead, Berhan advises Access Now's #KeepItOn Coalition on policy and advocacy engagements against internet shutdowns.

Individual Assignment

Measurement Data & Rapid Response Advocacy (Individual Assignment)

An NGO in Zimbabwe wants to advocate against internet shutdowns. They are asking you to help them build their policy and advocacy campaign. You can start with the shutdown incident in 2019.

They specifically need your help in figuring out the start date, end date of the shutdown (or shutdowns), identify which ISPs were affected, and help estimate the extent and duration.

Instruction – Use at least three of the network measurement tools – OONI, IODA, Oracle Dyn, Cloudflare, Google Transparency Traffic Disruption...

The NGO is new to this issue and does not know much about internet shutdowns. – hint: start by explaining to them what internet shutdowns are and how they affect their work.

Group Assignment

Designing your Research & Advocacy Plan (Group Assignment)

Now that you have your research question, background information, stakeholder analysis, methodologies for your research, we ask you to take all of this together and build a research and advocacy plan to describe what you expect to find from your research and how you will use it as part of wider-internet shutdowns advocacy. As part of this assignment, we expect you to have the following sections in a 5-10 page document, as well as a presentation for your fellow participants and mentors to provide feedback:

- **Project Summary:** Describe your research question and explain the relevance to internet shutdowns advocacy
- **Background information:** What research, data, and advocacy has been done in the past that is related to your project, and what gaps does your project fill
- **Stakeholder Analysis:** Who are the stakeholders & how does this impact both the research and advocacy you will undertake as part of this project
- **Research Methods:** Which tools, datasets, and research methods will you use to answer your research question
- **Advocacy outcomes:** What are your advocacy goals and how will you translate these research findings to accomplish these goals?
- **Key audiences for research:** Who are the most important stakeholders you will engage with and communicate research findings to
- **Communications methods and plan:** How will you communicate your findings and in what format? Research report? Data visualizations? Text Messages? Meetings with key stakeholders?
- **Timeline:** Plan include a comprehensive timeline for both the research and advocacy deliverables



Guest Speaker: Tracking shutdowns and applying research in India

Mishi Choudhary, SFLC.in

In this session, Mishi explores SFLC.in's Internet shutdown tracker, an ongoing project in operation since 2012 that has become the primary source for information on shutdowns in India. She outlines the importance of data to inform empirical advocacy efforts. Mishi also details the organization's litigation efforts and offers advice and best practices for engaging in successful strategic litigation using data.