Anne Josiane Kouam

Postdoctoral Researcher

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Personal webpage

Research Interest

My primary research focus lies at the intersection of mobile security & privacy and machine learning, with a particular emphasis on the individual. Thus, I investigate offensive and defensive AI models in fields where network users' security and privacy may be impacted. In detail, my research interests are :

- Mobile communications and networks security & privacy
- Data-driven technologies for mobile communications
- Attack, detection, and prevention
- Data science and artificial intelligence for mobile communications

Education

Nov 2019–May 2023   **Doctoral Degree**, *INRIA, Ecole Polytechnique-IPP*, France.
- Title: Bypass frauds in cellular networks : understanding and mitigation
- Goal: Fully understand fraudsters behavior and literature limitation to Build advanced models from various cellular network datasets to detect and mitigate fraud
- Advisors : Aline Carneiro Viana (Research director, INRIA) & Alain Tchana (Prof., ENS Lyon)
- Defended on the 11th May 2023

2014–2019   **Master Degree in Computer Science**, *Ecole Nationale Polytechnique*, Yaounde, Cameroon.
- Valedictorian, Excellent Grade, GPA: 3.81/4.0.

2014   **Baccalaureat (High School Diploma)**, *General Bilingual High School of Mendong*, Cameroon.
- Valedictorian, Excellent Grade.

Work Experience

Research

Jan 2024 -Now   **Postdoctoral researcher**, *TU Berlin*, Germany, Working under the supervision of Konrad Rieck in the ERC Malfoy project, i.e., Machine Learning for Offensive Computer Security.

May -Dec 2023   **Postdoctoral researcher**, *INRIA Saclay*, France, Cellular network datasets and infrastructure analytics and AI-based modeling.

Sep 2022-Apr 2023   **Research intern**, *(during PhD)*, *Telecom Paris*, France, Cellular signaling data collection and analysis from Faraday shield experimentation.

Nov -Dec 2022   **Research intern**, *(during PhD)*, *CNR Pisa*, Italy, Cellular network datasets (i.e., CDRs) modeling and generation.

Mar-Sep 2019   **Research Intern**, *(during Master)*, *IRIT Toulouse & I3S Nice*, France, In-memory storage design for Function As A Service (FAAS).

Teaching

Apr 2024- Now   **Mobile Security and Privacy**, *TU Berlin*, Germany, L2, Seminar, ≈16h.

Sep-Dec 2021   **Networking: switching and routing**, *Paris-Saclay University*, France, L2, TD & TP, 24h.

2021   **MOOC Trainer: Fundamentals of Network and Information Systems**, *Audience: CAPES France*, Dissemination: Fun-Mooc Platform and also available on YouTube!, ≈24h.

Oct-Dec 2019   **Distributed Systems and Virtualization**, *Ecole Nationale Polytechnique, Yaounde*, Cameroon, L3, Practical projects supervision, ≈12h.

Internships or Programs

Jul-Sep 2018   **Software engineer Internship**, *Computer Incident Response Team (CIRT)*, Cameroon.
Design and validation of an application for mobile subscribers' relations analysis useful for fraudsters identification

Jul 2015-Aug 2016	**CIMI program member**, *PolytechValor, Ecole Nationale Polytechnique, Yaounde*, Cameroon.

- Long period training to acquire skills such as speed reading, rapid typing, concentration, memorization, verification, etc.
- Organization of government conference for company workers
- Coaching and training of kids and high school students in vacations

Student supervision

Apr 2024-now	**Ivanna Bura**, *M2 student, TU Berlin*, Tracking Train Journeys: On Detecting Train Stops Using Permissionless Smartphone Sensors. 20% Supervision, Main supervisor: Stefan Czybik
Apr 2024-now	**Maximilian Erkel**, *M2 student, TU Berlin*, Tracking Train Journeys: On Detecting Track Segments Using Permissionless Smartphone Sensors. 20% Supervision, Main supervisor: Stefan Czybik
Sep 2023-Apr 2024	**Gaelle Yonga**, *M2 student, University of Douala*, Spatio-temporal data quality assessment process. 50% Supervision, Co-supervisor: Aline Carneiro Viana
Feb-Aug 2021	**Cliton Nyobe**, *M2 student, INRIA Intern*, Deployment and configuration of a hardware architecture for capturing and analyzing cellular network signaling, Excellent graded Defense. 80% Supervision, Co-supervisors: Aline Carneiro Viana, Alain Tchana

Publications

International Conferences and Workshops

Battle of Wits: To What Extent Can Fraudsters Disguise Their Tracks in International bypass Fraud?, **Anne Josiane Kouam**, Aline Carneiro Viana, Alain Tchana. **ACM AsiaCCS 2024** (**A Rank**, acceptance rate 19%)

LSTM-based generation of cellular network traffic, **Anne Josiane Kouam**, Aline Carneiro Viana, Alain Tchana. IEEE Wireless and Communications and Networking Conference **IEEE WCNC'23** (**B Rank**).

Simulating SIMBox frauds for detection investigation, **Anne Josiane Kouam**, Aline Carneiro Viana, Alain Tchana. **ACM CoNext Student Workshop 2022.**

OFC: an opportunistic caching system for FaaS platforms, Djob Mvondo, Mathieu Bacou, Kevin Nguetchouang, Lucien Ngale, Stéphane Pouget, **Josiane Kouam**, Renaud Lachaize, Jinho Hwang, Tim Wood, Daniel Hagimont, Noël De Palma, Bernabé Batchakui, and Alain Tchana. **ACM EuroSys 2021** (**A Rank**).

Journals

SIMBox Bypass Frauds in Cellular Networks: Strategies, Evolution, Detection, and Future Directions, **A. J. Kouam**, A. C. Viana and A. Tchana. **IEEE Communications Surveys & Tutorials**, Fourthquarter 2021 (**Q1**, Impact Factor 23.7).

National Conferences

Signalisation cellulaire pour la detection des fraudes de contournement, **Anne J. Kouam**, Aline C. Viana, Philippe Martins, Cedric Adjih, Alain Tchana. **CORES 2023**

Génération de traces cellulaires réalistes, **Anne J. Kouam**, Aline C. Viana, Aurélien Garivier, Alain Tchana. **CORES 2022**

Service to the scientific community

Technical PC	ICNS'23, ICNS'24, EuroDW'24, WiMob'24, ACSAC'24
Artefact Evaluation Committee	EuroSys'21, USENIX Security'22, CoNext'22, Mobicom'24
External Reviewer	IEEE Open Journal of the Communications Society (2024)
External Reviewer	EPJ Data Science (2024)
External Reviewer	Annals of Telecommunications (2024)
Sub-reviewer	IEEE Transactions on Network and Service Management (2021)
Shadow PC	Algotel & Cores'21 (National conferences, France)
Conference organization	"Feedback days", Ecole Nationale Polytechnique, Yaounde, Problem Solving session author

Conference organization	Computer Science Workshop with Women in CS Session, Ecole Nationale Polytechnique & UY1, Yaounde, Cameroon
Session chair	*Machine learning in and of Networks*, CoNext'22 Student workshop, Rome, Italy

Awards and Honors

Abbe Grant	≈**€1800**, *Issued from the Carl-Zeiss-Stiftung and Yearly attributed to 30 selected young researchers fully covering participation at the 11th HeidelBerg Laureate Forum.*
Selected Young Researcher	**HeidelBerg Laureate Forum (HLF) 2024**, *The HLF is a networking conference where 200 carefully-selected promising young researchers in mathematics and computer science around the world spend a week interacting with the most exceptional mathematicians and computer scientists of their generations.*
Best Student Paper	**CoRes 2023**.
SoBigData++ Fellowship	**Transnational Access**, *Grant for a 2 weeks Scientific Mission in Pisa, Italy.*
Diversity Grant	**Usenix SOUPS & ATC' 21**.
Student Grant	**ACM Sigmetrics' 21**.
Fellowship	**INRIA CORDI-S 2019**, *Grant for a 3 year PhD.*

Popularization

I like sharing my research to a wider audience, especially with the hope to encourage young girls to get an interest in computer science.

Apr 2024	**Workshop leader**, *Girls' day (i.e., Mädchen ZukunftsTag), TU Berlin, Germany*, Welcoming young girls from 7th to 9th grades. Conducted a 3-hour workshop focusing on the theme "What is Computer Science," including both unplugged and plugged programming sessions in Python.
Dec 2022	**Women in CS Session Panelist**, *Computer Science Workshop, Ecole Polytechnique, Yaounde, Cameroon*, Discussions with undergraduates about the researcher career, balance with personal lives, and challenges faced by female researchers.
Feb 2022	**Workshop leader**, *Rendez-vous des Jeunes Filles Mathématiciennes et Informaticiennes (RJMI), INRIA Saclay*, 2 days program with 25 selected Young girls interested in Mathematics and Computer Science.
Jan 2022	Talk to 3rd grade students in an observation internship, INRIA Saclay
Oct 2021	**Stand Animation at the science festival**, *Institut Polytechnique Paris (IPP)*, Welcoming the general public and explaining in an off-line style the concepts of algorithms and encryption.
Jul-Sep 2021	**Video Production: Explained Wireless Communications**, *Paris-Saclay Science Festival Saclay*, in French.
Mar 2021	**Talk: What is the job of a researcher? Presentation of the INRIA Institute**, *"mathematics week", Creteil Academy*.
Feb 2021	**Workshop leader**, *Rendez-vous des Jeunes Filles Mathématiciennes et Informaticiennes (RJMI), INRIA Saclay*, 2 days program with 25 selected Young girls interested in Mathematics and Computer Science.

Research projects and International collaborations

Sep 2022–Dec 2023	**Investigation of cellular signaling for SIMBox fraud detection in a Faraday Cage.**
	○ Philippe Martins *Telecom Paris, France*
From May 2023	**Complete and Privacy-preserving eXtended Data Records availability.**
	○ Luca Pappalardo, *CNR, Italy*
	○ Leo Ferres, *Universidad del Desarollo, Chili*
	○ Mariano Beiro, *Universidad de Buenos Aires, Argentina*
From Dec 2023	**Privacy vs Utility assessment in human mobility datasets.**
	○ Razvan Stanica, *INSA Lyon, France*
	○ Jussara F. Almeida, *UFMG, Brazil*

List of talks

2024 Jun 06   **Bypass frauds in cellular networks: from Financial strikes to Data poisoning**, *Invited talk*, Politecnico Di Torino, Turin, Italy.

2023 Dec 18   **Signalisation cellulaire pour la detection des fraudes de contournement**, *Invited talk*, LIG, Grenoble, France.

2023 Dec 11   **Agile strategy for achieving complete XDR dataset availability**, *STIC AmSud LINT Workshop*, Rio de Janeiro, Brazil.

2023 Oct 05   **SIMBox fraud: How well can they mimick your communication behavior ?**, *NetMob 2023*, Madrid, Spain.

2023 May 22   **Signalisation cellulaire pour la detection des fraudes de contournement**, *CORES 2023*, Cargèse (Corse), France.

2023 May 11   **SIMBox bypass frauds in cellular networks: understanding and mitigation**, *Thesis Defense*, Palaiseau, France.

2023 Mar 27   **LSTM-based generation of cellular network traffic**, *WCNC 2023*, Glasgow, Scotland.

2023 May 22   **Diving into the illegitimate: international bypass fraud mitigation**, *Invited Talk*, TU Berlin, Germany.

2022 Dec 20   **On the intricacies of generating individuals' cellular network datasets**, *Computer Science Workshops*, Yaounde, Cameroon.

2022 Dec 9   **Simulating SIMBox frauds for detection investigation**, *CoNext'22 Student workshop*, Rome, Italy.

2022 May 30   **Génération de traces cellulaires réalistes**, *CORES 2022*, Saclay, France.

2022 Apr 28   **Simulation of bypass frauds in cellular networks**, *GDR RSD 2022*, Rennes, France.

2021 Sep 21   **What is International Bypass fraud ?**, *Women in Security and Cryptography Workshop (WISC)*, Online.

2021 Jun 1   **Detection of bypass frauds in cellular network datasets** , *Workshop on Cloud, Storage and Virtualization*, Brest, France.

2020 Dec 15   **Reproducible Engineering**, *Feedback Days*, Ecole Nationale Polytechnique, Remote talk.

Posters

2023 Feb 10   **On the intricacies of per individual cellular network datasets generation**, *NetSci-X*, Buenos Aires, Argentina.

2022 Aug 31   **Producing complex realistic Call Detail Records**, *IDESSAI Summer school*, Saarbrucken, Germany.

2022 May 16   **Zen: producing complex realistic Call Detail Records**, *Doctoral Day IPP*, Palaiseau, France.

Institutional Responsabilities

2024-   SoBigData++ TransNational access External Reviewer

2023-   Member of the STIC AmSud LINT INRIA Associated team

2021-2022   Center Committee Member, INRIA Saclay

2021-2023   Member and WebMaster of INRIA Associated team MLNS2

2020-2021   Scientific popularization mission (2020-2021), INRIA Saclay

Languages and Programming

Langages   French (*Native*), English (*Advanced*), German (*Intermediate*), Spanish (*Basic*)

Programming Langages   Python, C/C++, Java, Shell

Interests

Leisure   Graphic design, Piano, Cooking, French literature

Association   Co-founder of Cadres360, a christian association for workers well-being in all domains