CURRICULUM VITAE

PERSONAL INFORMATIONS

- PILAH MBIESSET Marius Blaise.
- Date and place of birth: 13/08/1992 at Buea.
- Nationality: Cameroonian.
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PROFESSIONAL SUMMARY

Highly motivated researcher with a unique interdisciplinary background in physics and cybersecurity. My doctoral research in physics focused on localized waves in inhogeneous media, notably Bose-Einstein condensates, developing strong analytical and numerical modeling skills. In parallel, I pursued a Master's degree in cybersecurity with a specialization in embedded systems security and cryptology, where I demonstrated consistent academic improvement. This dual expertise places me in a unique position to address emerging challenges in cyber-physical systems security, notably by applying the principles of electromagnetic wave theory to identify and mitigate EM-based vulnerabilities in embedded systems. My research objectives align with the development of innovative security solutions applicable to the protection of critical infrastructures, particularly in developing regions such as Cameroon.

EDUCATION

MSc in Cybersecurity and Mathematical Cryptology (Embedded Systems Security and Cryptology)

Center for Cybersecurity and Mathematical Cryptology
2023 - Present (Expected completion: June 2025)

- **Thesis Topic:** "LIGHTWEIGHT POLYNOMIAL MULTIPLICATION FOR POST-QUANTUM CRYPTOGRAPHIC SCHEMES"
- **Current GPA:** 3.0/4.0 (with consistent improvement from 1.95 to 3.0 over three semesters)
- **Notable Coursework:**
  - Embedded System Security Lab (Grade: A)
  - Digital Systems Design (Grade: A)
  - Hardware Implementation of Cryptographic Engines Lab (Grade: B+)
  - Hardware Design: PLD and SOC Design Lab (Grade: B+)
  - Internet of Things and Security Challenges (Grade: B)

    - Advanced Cryptology: Cryptanalysis, Protocols, Norms and Standards (Grade: C+)
    - Embedded C and Real-Time Operating System (Grade: B)

PhD in Physics (In Progress)

University of Dschang
2021 - Present

- **Thesis:** "Analytical and Numerical Study of Localized Wave in Inhomogeneous Medium: The case of Bose-Einstein Condensate"
- **Research Focus:** Theoretical mechanics, stochastic analysis, electromagnetic wave theory, and numerical modeling

Master's in Physics (Energy Mechanics Option)

University of Dschang
2016 - 2017

- **Research Focus:** Wave propagation in complex environments, mathematical modeling of physical systems

Additional Education

- Successfully completed specialized coursework during Summer Semester 2021 at Julius-Maximilian's-Universität Würzburg

TECHNICAL SKILLS

Interdisciplinary Expertise

- **Theoretical Physics & Cybersecurity Integration:** Applying wave theory principles to understand EM-based vulnerabilities in embedded systems
- **Mathematical Modeling:** Advanced mathematical modeling applicable to both quantum cryptography and cyber-physical system security
- **Analytical Approaches:** Rigorous analytical thinking developed through physics research, applied to security vulnerability analysis

Cybersecurity & Cryptography

- Post-Quantum Cryptography algorithms and implementation
- Embedded systems security analysis and hardening
- Hardware security for cryptographic implementations
- Digital Forensics (EC-Council certified)
- Secure software development practices
- Network and wireless security protocols

Programming & Technical

- Python (Data analysis, Security applications, Simulation)

- C/C++ (Embedded systems programming)
- Embedded C and Real-Time Operating Systems
- MATLAB (Mathematical modeling, Signal processing)
- LaTeX (Technical documentation)
- Linux and Windows operating systems

Hardware & Embedded Systems

- Digital systems design and implementation
- Hardware security modules and trusted platform modules
- SOC and PLD design for secure embedded applications
- IoT security architecture and implementation
- Side-channel attack analysis and countermeasures

RESEARCH EXPERIENCE

Cybersecurity Master's Thesis Research

Center for Cybersecurity and Mathematical Cryptology
2024 - Present

- Researching efficient implementations of polynomial multiplication algorithms essential for lattice-based post-quantum cryptographic schemes
- Focusing on resource-constrained environments such as embedded systems and IoT devices
- Analyzing performance, security, and resource utilization trade-offs

Physics Doctoral Research

University of Dschang
2021 - Present

- Developing novel numerical models for studying wave localization phenomena in Bose-Einstein Condensates
- Applying stochastic analysis methods to characterize wave behavior in inhomogeneous media
- Exploring potential applications in quantum information processing and security

PUBLICATIONS

1. **B. M. Mbiesset Pilah**, Désiré Ndjanfang, Hatou-Yvelin Donkeng, David Yemélé. "Compact bright pulse in inhomogeneous and nonlinear medium: case of the Bose-Einstein Condensate." *Wave Motion* 127 (2024) 103274.
2. H. Y. Donkeng, W. Kamgaing Mabou, F. kenmogne, **B. M. Mbiesset Pilah**, Chancelor Pokam Nguewawe, David Yemélé. "Propagation of the ordinary and extraordinary modulated optical pulses in a nonlinear Kerr-type birefringent optical waveguide: Analytical description." *Results in Optics* 12 (2023) 100484.

CERTIFICATIONS & HONORS

- Digital Forensics Essential (DFE), EC-Council, 2024
- Student Ambassador of the American Physical Society (APS), 2023-2024
- Winner of the "Prize Francesco Iorio" at the 6th International Conference on "HIGH LEVEL PHYSICS APPROPRIATE SOLUTION TO REAL LIFE PROBLEMS IN DEVELOPING COUNTRIES," Cameroon Physical Society, 2019
- International Certification in Management Art, SMC University (Swiss Management Center), 2018

PROFESSIONAL MEMBERSHIPS & ACTIVITIES

- Student Ambassador, American Physical Society (APS)
- Member, Physics Club of University of Dschang
- Participant, Research Unit for Mechanics and Modeling of Physical Systems (UR2MSP) project development seminars

COMMUNITY ENGAGEMENT

- Socio-Educational Facilitator, "Les Francas"
- Active Member, JESBA Cultural Association (Student and School Youth of Bamenyam)
- Former Student Delegate, Association of Science Faculty Students (AEFS)
- Study in Business Management and Environmental Protection, SAJE (Solidarity in Action for the Youth of Cameroon)

LANGUAGES

- French: Fluent (Native level proficiency)
- English: Proficient (Professional working proficiency)

RESEARCH INTERESTS & MOTIVATION

My research interests lie at the intersection of physics, mathematics, and cybersecurity, particularly in:

1. **Electromagnetic Side-Channel Analysis:** Applying my physics background in electromagnetic wave theory to develop and mitigate side-channel attacks against embedded systems.
2. **Post-Quantum Cryptographic Implementations:** Optimizing cryptographic algorithms for resource-constrained environments while maintaining security against quantum threats.
3. **Physical Security of Cyber-Physical Systems:** Developing comprehensive security frameworks that address both digital and physical attack vectors in critical infrastructure.
4. **Security Solutions for Developing Regions:** Creating resilient, cost-effective security solutions appropriate for deployment in developing nations like Cameroon, where cybersecurity infrastructure is still evolving.

I am deeply motivated to contribute to the advancement of cybersecurity practices in Cameroon and similar developing regions. My interdisciplinary background allows me to

approach security challenges from multiple perspectives, combining theoretical rigor with practical implementation considerations.

REFERENCES

1. **Pr. FOUOTSA Emmanuel**
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4. **Dr. NJANFANG Désiré**
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