



UNIVERSITE D'ABOMEY-CALAVI

ECOLE POLYTECHNIQUE D'ABOMEY-CALAVI

Doc. No. : EPAC-UAC/OSC/0002

Issue No.: 02

Date of Issue: 30th NOV, 2023

Student Chapter

Report

(Annual Year of 2023)

Chapter Name: EPAC-UAC Student Chapter of the Optica

Chapter Approval (by Optica): 25th November 2022

Chapter Advisor: Dr SANYA Max Fréjus Owolabi (*University member*)

Chapter Executive Team (Students Core Team) :

President – MAGNIDET Fifamè Merci-Ange

Vice President – AFOUDA Serge Oluwatogni Kolawalé

Secretary – ZINZINDOHOUÉ Yasmine Fifali

Treasurer – CODJIA Mahouwèna Canisius Boris

No. of students registered in society: 10

OBJECTIVES

EPAC-UAC Student Chapter of The Optica is a technical platform that aims to:

- promote and actively delivers scientific and technical information on optical science and photonics engineering among the student and local communities in Benin;
- promote interaction with the Optica society members ad its student organizations with a focus on information sharing and networking to raise awareness of post-graduation opportunities for students;
- to ensure quality information and inspiring interactions through publications, meetings and membership;
- locally innovate based on optical sciences and photonics engineering to solve societal concerns in Benin and Africa.

ANNUAL GOALS OF THE STUDENT'S CHAPTER

- **GROWTH & MEMBERSHIP:** Our goal is to have a wider impact on our community. Thus, we will increase our reach with social media and through workshops, highlighting the benefits of OPTICA to be known and enroll more students in the chapter. By starting include people at college and campus level, the more helping hands we have, the better it is to be wider impact our community.
- **EDUCATION:** Get involved in education at the lowest level possible and stimulate young students interest in the field of optics and photonics by teaching the basics of the field and/or making demonstrations of innovations we've made.
- **INNOVATION:** Participate in our community by conducting research and proposing innovative solutions to community-related problems. In addition, we will explore research venues for the publication of articles.
- **PROFESSIONAL DEVELOPMENT & LEADERSHIP:** Organize hands-on sessions to talk about optics and photonics technical-related subjects and favorite networking between students and chapters (in Africa and overseas).

Activity No. 1: (Annual work plan and Review of the association's by-laws on January 07, 2023)

- 1. Name of the Activity:** Proposition of the annual work plan
- 2. Student chapter:** EPAC-UAC Student Chapter of The OPTICA
- 3. Organizer(s):** Executive board officers supervised by the Advisor
- 4. Objectives:** The objective of this activity is to provide a first draft of the Chapter's Annual work plan with review of its bylaws and rules for validation in plenary.
- 5. Student Attendance:** ([See the Attendance Link](#))
- 6. Summary of the event:**

The second objective of this activity is still ongoing for validation. In fact, it was decided by the executive board officers in order to propose a final version of the chapter's bylaws and rules. For that, all the participants have been split into small groups of members with the aim of reviewing the first draft of the chapter's bylaws to executive board and members. The secretary and vice-president have then been charged for collecting all the drafts provided by each group into one final document for the chapter. The final validation is scheduled to take place in August 2023. At this step, we have made a plan for the chapter annual work. The Chapter's bylaws and rules draft is written in French language (National work language in Benin) and available [here](#). We are online and active on facebook, twitter and linkedIn networks by :

- <https://twitter.com/UACoptica?t=YEm0EUDSIozzkX26Ai9p6Q&s=09>;
- <https://www.facebook.com/epac.uac.chapter.optica?mibextid=ZbWKwL>;
- <https://www.linkedin.com/in/uac-students-chapter-of-optica-0a4879258>;
- <https://www.linkedin.com/company/epac-uac-student-chapter-of-the-optica/>;
- For our online activities, we always use google meet and zoom.

Activity No. 2: Practical work sessions in Combinatorial and Sequential Logic Circuits for EPAC students and Applications

- 1. Name of the Activity:** Practical work sessions in Combinatorial and Sequential Logic Circuits for EPAC students and applications
- 2. Student chapter:** EPAC-UAC Student Chapter of The OPTICA
- 3. Organizer(s):** Executive board officers supervised by the Advisor

4. **Objectives:** The aim of these sessions was to train EPAC students, especially those in Electrical Engineering and Computer and Telecommunications Engineering, to the practical use of optical components such as LEDs in their course entitled "***Combinatorial and Sequential Logic Circuits***".
5. **Period of the activity :** Every Tuesday and Wednesday 11 a.m.-1 p.m. from February 07 to July 28, 2023
6. **Budget used:** The \$350 USD startup funds provided by Optica Society.
7. **Student Attendance:** (See the Attendance [List1](#)+[List2](#))
8. **Summary of the event:**

The lack of practical experience in teaching is targeted by these sessions, enabling students to get to grips with the sizing and realization of logic circuits. This was made possible by acquiring electronic components and making them available to students under our supervision and management. Afterwards, some of last year's projects were designed as final practical applications at the end of the sessions. These include :

- **Session of speedometer bench design**

Speeding is a common practice, widely observed on the roads in Benin. Late for work, the desire to run traffic lights, the presumed need for urgency, overtaking, are among the pretexts given by drivers as a result of this bad driving practice. This causes most of the time, deplorable cases of road accidents. In this practical session, we have divided the students into groups of 03 or 04 to support them in the speedometer designed last year (2022) by our chapter. Using an Arduino Uno R3 board assembled with some electronic components, a speedometer bench has been designed by each group of students.

- **Session of a LiFi (Light-Fidelity) bench for data transmission**

In Benin, as in most African countries, the history of the various tourist sites and art objects in a museum requires the presence of a resource person or guide to tell or explain certain facts. However, this history can be poorly told, distorted or vary from one tourist to another, depending on the state of mind or desire of the person telling it. Last year, we have made a LiFi prototype that contributes to distort the tourist atmosphere and reduce the attraction to certain tourist sites and museums. The idea of using LED lighting to transmit information to tourists' smartphone cameras is an innovative digital dimension for museum visits. In this practical session too, we have divided the students into groups of 05 or 06 because of insufficient material to support them to success this practical LiFi session. With presentation

and assistance of authors of this LiFi prototype, we get good results and attraction of many students.

9. Photographs:

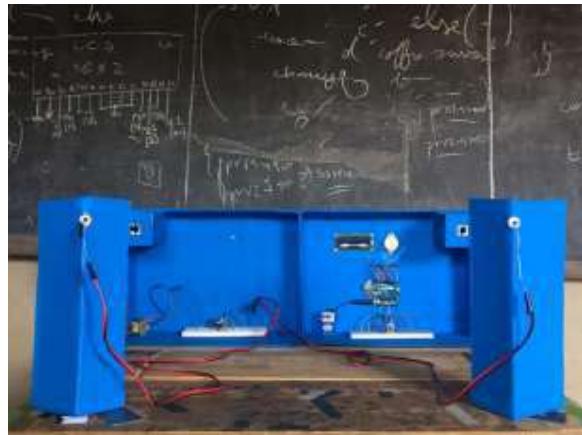


Fig. 1: Example of a speedometer finalized by students

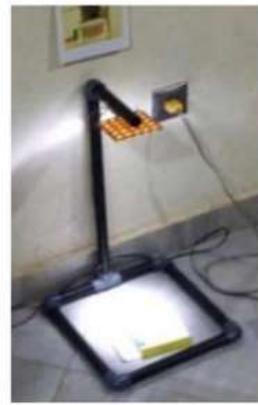


Fig. 2: Example of a LiFi bench design

(@source: EPAC-UAC Student Chapter of the Optica)

Activity No. 3: Participation to LRSIA Seminar as invited speaker and demo sessions

- 1. Name of the Activity:** Participation to LRSIA Seminar as invited speaker
- 2. Student chapter:** EPAC-UAC Student Chapter of The OPTICA
- 3. Organizer(s):** [IFRI](#), Dr. Arnaud AHOUNDJINO / +229 97213568
- 4. Objectives:** The objective of this activity was first to promote and deliver scientific and technical information on optical science and optical engineering among the student and researchers that have attended [LRSIA Seminar](#) (Computer Science and Applications Research Laboratory) organized by [IFRI](#) (Institut de Formation et de Recherche en Informatique) at University of Abomey-Calavi on March 21, 2023. The second objective was to ensure quality information and inspiring interactions through publications/posters and live demo of our innovative projects.
- 5. Student Attendance:** 50+ (NA)
- 6. Summary of the event:**

The Seminar sessions of the IFRI LRSIA took place in the IFRI amphitheater of the University of Abomey-Calavi during March to May 2023. The meeting brought together participants from University of Benin in Optical area and Artificial Intelligence (face-to-face

and remote through the Internet). Our Chapter was invited to participate and our supervisor Dr SANYA Max Fréjus Owolabi as invited speaker to session of March 21, 2023. Dr. Max Fréjus SANYA presented our chapter and its motivations as well as the results of its research work, inviting the researchers and other students present to join us in promoting the demystification of photonics and optics in Benin and the sub-region through our contacts with the population through the results of research work contextualized and solving the problems of our communities. At the end of his presentation on free-space wireless optics (FSO), he even talked about some of our innovations such as LiFi, and invited some of his colleagues to join him in a science-for-all concept in which he would soon be taking part. Our contribution was to talk to the participants about the opportunities offered by Optica (See [Participants List](#)) and by our student chapter as a branch of Optica in Benin.

Other Activities : Presentation of some of our work at the national television of Benin

- 1. Name of the Activity:** Ensure visibility of our chapter and work
- 2. Student chapter:** EPAC-UAC Student Chapter of The OPTICA
- 3. Organizer(s):** Executive board officers supervised by the Advisor
- 4. Objectives:** The objective of this activity was and is an ongoing point to make more visible our chapter and work to communities.
- 5. Student Attendance: 5 / Target : Television viewers**
- 6. Summary of the event:**

These activities are to demystify some concepts regarding Optic and photonics applications and theory in live at the national television of Benin called (ORTB). Many of our work and others are presented by our advisor Dr. SANYA Max Fréjus and some of our members that are authors of innovative projects. Some videos and picture can be found [here](#).

GOALS OF THE CHAPTER FOR 2024

As activities planned for the year 2024, we intend to:

- Register our new motivated chapter member in order to be more visible;
- Make two (02) or three (03) events or workshops in Optics or Photonics Area like Visible light communications and Free space optical communications with partners and collaborators from national and international;

- ensure a greater visibility of the chapter with social media and by organizing more lives and events on social networks;
- explore new avenues of research on photonic systems with AI systems integration;
- expand the chapter with the integration of new members and attend to many international conferences for more impact.

<u>Chapter President</u>	<u>Chapter Vice President</u>
 Mrs. MAGNIDET Fifamè Merci- Ange	 Mr. AFOUDA Serge Oluwatogni Kolawalé

Chapter Advisor (Head)



Dr. Max Fréjus Owolabi SANYA

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Deputy-Coordinator of the Computer Science and Telecommunications Research Master at ED-SDI/UAC,
Benin