African Building Heritage Project: A Collaborative Research Initiative

Introduction

The African Building Heritage Project is a collaborative research initiative spearheaded by faculty and researchers from Northeastern University in collaboration with L'Ecole du Patrimoine African (Porto Novo, Benin). The team includes experts from History, Architecture, Communications, Visual Arts/Engineering, and the DGS department.

This project focuses on the preservation of at-risk sub-Saharan African building sites through advanced technological methods, interdisciplinary collaboration, and storytelling. The research, which involves fieldwork and data gathering in Porto Novo, Benin, utilizes LiDAR scanning (including drone photogrammetry), 3D modeling, geospatial technology, oral history, archival research, VR/AR technologies, photographic documentation, and digital preservation to produce a hub that preserves holistically (in digital form) and educates about the importance of at-risk sub-Saharan African Heritage Buildings.

Research Team

The project brings together a diverse team of scholars:

- **Killion Mokwete** (Architecture)

- **Jessica Par**r (History)

- **Patricia Davis** (Communications)

- **Mark Sivak** (Visual Arts/Engineering)

- **Bahare Movahed-Sanaie** (DGS)

Research Assistants

- **Abraham Silver** (Current Architecture student)

Past Research Assistants

- **Halima Haruna** (History PhD Student)
- **Gavin Gershman** (Architecture Student, class of 2024)

Project Goals

The primary goal of the African Building Heritage Project is to create a geospatial archive of 3D models of endangered sub-Saharan African buildings. These buildings are under threat due to climate change, infrastructure deterioration, war, and terrorism. The project

employs LiDAR technology to generate detailed 3D models, ensuring these cultural landmarks are digitally preserved. The hub is rounded out with oral histories from community members and stakeholders, photograph, and other media to tell the stories of the buildings and the communities they serve.

Funding and Partnerships

The project was initially funded by a Tier One grant from Northeastern University, which supported the field research conducted in Porto-Novo, Benin, in December 2023 and June 2024. The June 2024 fieldwork, which included introduction of a drone, was funded in part by a Research Development Initiative Grant by CSSH.

Collaborating with L'Ecole du Patrimoine African in Porto-Novo, which operates under a UNESCO mandate, the project aligns with global efforts in historic preservation and cultural heritage. The Northeastern team collaborates with L'Ecole du Patrimoine African on the research design, fieldwork, and creation of the digital hub prototype, and has begun working on developing technological training models for partners in Benin and beyond.

Methodology

The repository developed by the project includes:

- Oral histories from stakeholders and community members

- Photographic documentation

- Recordings of cultural events associated with the buildings, including 360 film.

- Scans of material culture

- Archival research

- 3D models of the buildings, created using a surface scanner and drone.

- VR/XR outputs (currently in development).

This approach ensures a comprehensive documentation of the buildings' cultural and historical significance. The data is owned by our partners, emphasizing a post-custodial model that respects data sovereignty and ethical considerations, including an emphasis on the African partners and stakeholders' ownership of their own data.

Field Research and Findings

During the initial fieldwork in Benin, the team scanned five significant buildings, including an Afro-Brazilian Mosque (The Grand Mosque, built between 1912-1925) believed to be built by descendants of participants in the 1831 Male Slave Revolt in Bahia. The Mosque,

currently in disrepair due to environmental damage, is a key focus of the preservation efforts. Additional scans have included The Homne Museum (historically the Royal Palace of the Kings of Porto Novo), the campus of L'Ecole du Patrimoine African, and several important sites related to Voodoo.

Technological Innovations

Co-PIs Killion Mokwete, Jessica Parr, Patricia Davis, and Bahare Sanaie-Movahed have worked with colleagues in Benin as well as Northeastern students in Boston to produce a geospatial digital hub that has leveraged remote sensing and LiDAR scans of georeferenced buildings of the sites scanned during fieldwork. This summer, Bahare worked with co-op students to digitize remote sensing data to improve the quality of the street-level map on which the hub "rests." Under Killion and some of his architectural students, the team is reverse engineering functional blueprints of the buildings, where none previously existed. Jessica Parr, who is cross trained as a historian, digital humanities scholar, and archivist, will be working on the informatics for the project. Additionally, the project aims to support the registration of these sites with UNESCO to secure funding for their preservation. Interactive Virtual Reality (VR) models are being developed to facilitate virtual visits and serve as digital preservation tools, should the physical structures become irreparable.

Digital Hub and Public Engagement

The **Africa Built Heritage Digital Hub** was launched at the Carolina Lowcountry and the Atlantic World Conference in Charleston, SC. This platform allows users to explore the project's findings and models interactively: [Africa Built Heritage Digital Hub](#)

The project's progress is also documented on Instagram, serving as a public field journal: **[African Building Heritage Project (@africanbuildingheritage)](#)**

The team has an invited virtual talk with the Digital Humanities Seminar of the Institute for Historical Research in December, and will be presenting at the annual meeting of the National Council for Public History and the London Heritage Conference next year.

Future Directions

Supported by CAMD funding, the project has hired two part-time post-docs to assist with grant writing:

- A Northeastern teaching fellow with extensive experience in federal grants.

Additionally, a Co-op student is developing VR simulations for an exhibit at the Boston Society of Architecture, and an undergraduate is assisting with blueprint development.

The next phase of fieldwork, partially funded by a CSSH RDI grant, will include:

- Additional oral histories, which included an audience with the current King of Porto Novo and an interview of the King by Jessica Parr

- Conventional archival and library research (conducted in French)

- Utilization of a laser-guided drone for improved photogrammetric studies, including roof scans

Future plans include acquiring a terrain drone to enable comprehensive street-level mapping, additional archival research, more interviews, scans of buildings beyond Porto Novo, and the beginning of technological training for colleagues in Benin. During the last visit, the team also installed Bluetooth enabled climate loggers at The Grand Mosque and The Homne Museum and took initial temperature and humidity readings at both sites, as well as some infrared scans of portions of the building walls. The climate data loggers are set to collect data for twelve months and are monitored by faculty and students at L'Ecole du Patrimoine African.

The team is also expecting to launch an exhibit based on the initial rounds of research in Boston in early November, with an additional launch in Porto Novo for community stakeholders there.

The African Building Heritage Project exemplifies the power of interdisciplinary collaboration and technological innovation in preserving cultural heritage. By documenting and digitally preserving these at-risk sites, the project not only safeguards history but also enhances public engagement and awareness of Africa's rich architectural legacy.

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