Faculty of Health Sciences
Forensic Anthropology Research Centre

01 August 2022

South African Heritage Resources Agency (SAHRA)
Office 101, 1st Floor, Suncardia Mall,
541 Madiba Street, Pretoria

To Whom It May Concern,

The following letter addresses any concerns from SAHRA regarding the curation of three-dimensional (3D) of historic skeletal remains from the Koffiefontein Diamond Mine, in Koffiefontein, South Africa for the project entitled "*Bioarchaeological analysis of the skeletal remains from the Koffiefontein Cemetery, Kimberley, South Africa.*" The curation, management, storage and protection of this data is summarized below, and forms part of the Ethics Constitution of the Bakeng se Afrika repository.

Curation, management and storage of 3D surface scanned data

All 3D surface scans taken from the in-situ skeletons, the skull and the pelvis are to be stored on the Bakeng se Afrika (BsA) repository. The repository is a digital imaging database of micro-XCT scanned donated skeletal material of South African individuals from three South African tertiary institutions (Pretoria Bone Collection, the Sefako Makgatho Human Skeletal Collection and the Stellenbosch Kirsten Collection). Other types of curated scans include cone beam computed tomography (CBCT), computed tomography (CT) scans, and 3D surface scans. By creating the repository, BsA is able to preserve and share digital copies of skeletal data for ethical use in research and teaching, nationally and internationally. The types of data acquired through the combined efforts of the consortium, considering short- and long-term outcomes include quantitative; qualitative; clinical records and images. Ethical approval has been granted for the repository from the University of Pretoria (DR 619/2021) and is updated annually.

Data Management, documentation and curation

Managing, storing and curating data.

The scanned data is reconstructed, and in some cases segmented or combined, so that each stack of high-resolution scans is formed into a 3D digital image of a bone. The original stack of images, as well as the reconstruction of the bone is saved and stored on a physical server, which is housed and maintained at the University of Pretoria. Backups of the data are also stored on a separate space within the University of Pretoria system. All data loaded to the UP server, becomes the primary property of UP and has been stipulated as such in the signed partner agreements. The 3D surface scanned data is to be treated in the same manner as other digital data.

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Metadata standards and data documentation

Although metadata is generated from the acquired scans, this will not be available on the repository server. No identifying information such as names or identification numbers will be available as most of this information is stored at the respective skeletal repositories.

Data will be sorted in such a manner that search filters can be applied which include (where applicable):

- Sex
- Age
- Ancestry
- Geographic origin
- Place of death
- Cause of death
- Inventory of skeletal elements
- Imaging modality

Data preservation strategy and standards

Maintaining data integrity will be a joint effort between the management and technical staff of BsA of the University of Pretoria Department of IT Services. The BsA scanning team have multiple quality checks to ensure that each dataset that goes on to the server adheres to predefined quality parameters. Once on the server, the data is subjected to a final check by the BsA Quality Assurance personnel. The populated data hosted on the BsA Server will also be subject to annual gross checks by the technical personnel. The security and integrity of the hardware and systems used to maintain the data, is the responsibility of UP Department of IT Services. Through the services offered by them, the policies and procedures implemented are expected to secure the systems and hardware for both the BsA users and researchers. These policies are available via the following link:

https://www.up.ac.za/up-wireless-network/article/277119/relevant-policies

Data security and confidentiality of potentially disclosive information

Information/data security standards

The security of the servers and back-up systems which house the data is the responsibility of the UP Department of IT Services. Through numerous discussions between BsA management and IT services, it has been established that access to data will be addressed through a tiered approach, according to the security needs of the data type (see data sharing and access).

Access to the servers entails access from within the UP-intranet grid only: access is limited to connections from within the university infrastructure. This is required for both the upload and organization of data on the server.

At this stage, access credentials to the server have been provided for a total of 10 users who will be able to edit and change data. These credentials will be reviewed annually as the roles and responsibilities within the BsA Repository evolve. These access credentials can only be granted through UP Department of IT services upon direct request from the BsA management team/Forensic Anthropology Research

Centre (FARC). Once access is obtained, changes to the server can only be achieved by connection on a static device maintained at/on the primary campus. Changes are therefore dependent on:

- physically being on campus;
- having access to one of the few static computer lines approved to access the server;
- having access credentials assigned by UP Department of IT Services.

Data sharing and access

Suitability for sharing and governance of access

Essentially all data on the BsA repository is available for use, free of charge, pending review and authorization of the relevant uses. Applications will be reviewed, and access will be granted through a tiered approach:

- On the first, open tier, data generated from the scans of one skeleton is available to access by any user;
- The second tier is comprised of the images of skeletal material scanned from South African skeletal collections. All images in this tier are obtained from deceased individuals and access requires the submission of a completed research proposal and approval by an appropriate research ethics committee;
- The third tier comprises content from forensic cases stored at UP under contractual obligation with the SAPS, as well as CT scans of living individuals obtained from hospitals and medical practices, and the 3D surface scans from the Koffiefontein Miners. The data from the third tier is double-encrypted can only be accessed upon request and no metadata thereof is available through the Figshare platform. This is in accordance with the latest version of the Protection of Personal Information Act No 4 of 2013.

In summary, the Restriction Classifications are defined as:

1. **Open:** material (skeletal scans) compiled by BsA teaching purposes (general use);
2. **Controlled:** material (skeletons, living, cadavers) compiled by BsA for research purposes (research use);
3. **Restricted:** forensic cases, identifiable material, pathological material, other sensitive material such as 3D surface scans of the Koffiefontein Mine Workers and other archaeological material.

- For first tier data, the user can simply agree to the terms and conditions and download the data, and complete the data utilization agreement (DUA) with the University of Pretoria.
- For second tier data, users can filter the data that they deem useful for their research. Users must then contact the Forensic Anthropology Research Centre in order to obtain a provisional letter of approval to use the data. This letter is attached to an application of the research protocol to the Health Sciences Research Ethics Committee at UP (or another relevant research ethics committee in the country). After ethical approval has been granted, users are sent the links to download the relevant data for their research from the server at the University of Pretoria.
- The metadata for third tier data does not appear on the publicly available platform, no pictures will be available of the material. Researchers must contact BsA/Forensic Anthropology

Research Centre (FARC) directly to inquire about the availability and use of third tier data, the use of which will then be discussed on a case-by-case basis.

Users must agree to the terms and conditions specific to the data they want to use before they are granted access and the legal representative of their institution needs to sign a digital utilization agreement with UP.

- Once users have been granted access to the data on the repository via a link, they can download the data using the internet. BsA is not responsible for any data costs incurred due to the download of data.

It is important to note that all terms and agreements will be subject to constant review by the UP Department of Research & Innovation Support (DRIS) and will address all considerations as defined by the Protection of Personal Information (POPI) Act of 2003.

National and Globe Access to the BsA Data Repository

A data repository is considered "*a central secure place, or digital warehouse, where data together with their metadata are stored and maintained. A repository can be a place where multiple database or files are located with access through the Internet*" (Data Management Policy, University of Pretoria). All data collected, created or generated by students and employees of the University of Pretoria through the BsA project and associated research belongs to UP and must be stored and maintained in perpetuity at the institution. BsA data is managed and curated effectively on its own server at UP. Access and use to the repository are aligned with the research data management policy at the University of Pretoria (UP), the National Health Act 21 (2003),(NHA) the National Heritage Resource Act 25 (1999) and the POPI Act of 2003.

Kind regards,

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