Project Title: "Searching for Black People in a White Nation: Recovering the Archives of Black Activism in late 20th and early 21st Century Argentina"

Abstract:
I am requesting funds for a month-long research trip to Buenos Aires, Argentina to collect archival material on Black political activism during the late 20th and early 21st centuries. The material is exclusively located in the private collections of activists, scholars, and other community members rather than in centralized institutions. I will photograph and scan the materials and interview the individuals who own them for context on what is collected. The information will be used for the chapter "Searching for Black People in a White Nation" which will be in my forthcoming first monograph.

Project Narrative
I am applying for funding to support a month-long research project to digitally collect pamphlets, posters, flyers, photographs and other material related to Black political organizing in Buenos Aires, Argentina during the late 20th and early 21st centuries. These materials correlate to conferences, workshops, meetings, and other public events organized by and for Africans and Afro-descendants in Argentina. As this is an extremely new area of research, all of these items are located in the private collections of activists, scholars, and other community members and not accessible to the general public. The materials will be used for my current book project, *Searching for Blackness in Buenos Aires: The Resurgence of Black Identity in Argentina*, which charts Black political activism in present-day Argentina. Specifically, they will provide the foundation for the chapter titled "Searching for Black People in a White Nation" which focuses on efforts to combat anti-black racism in Argentina, a nation that defines itself as "European" or white. I will also conduct interviews with the individuals who possess these items in order to provide a more robust context for understanding these materials. I have the data needed to complete the writing of all of the chapters with the exception of the one proposed.

Argentina is currently experiencing a resurgence of Black identity. In spite of the reality of racism in Argentina (Anderson 2014), Argentines, like many Latin Americans, hold class as the most important factor in explaining social inequalities. In my work I demonstrate the ways in which race significantly shapes the everyday existence of members of the African diaspora in Buenos Aires. By the late 1990s, Argentina along with the rest of Latin America experienced a multicultural turn in which new policies recognized the presence and legal rights of indigenous and Afro-descendant populations. Regional pressure from Black people organizing across nations motivated these changes. By 2000 almost all countries in the area were collecting ethno-racial data on their censuses (Davis, Paschel, and Morrison 2012, Telles and PERLA 2014).

The proposed chapter examines how blackness in present-day Argentina is being reworked and collectively redefined in a diasporic manner by African immigrants, Afro-Latin American immigrants, and Afro-Argentines (Anderson 2018). This is evidenced by the formation of multiple Black organizations as well as civil and state sponsored events highlighting blackness in the nation like the U.S. Embassy's Black History Month celebration. In 2007, several changes in ethno-racial policies were made following the election of Cristina Fernández de Kirchner as president of Argentina under the Justicialist Party. The most significant gain under her administration was the return of a category for Black people on the 2010 census (Anderson and

Gomes 2021). Local Black activists campaigned to officially include the category of "Afro-descendant" marking the return of blackness to national data collection efforts after over a century of absence.

This pivotal chapter addresses the foundation for the recent resurgence of blackness and how the contours of blackness are defined by different actors in the public sphere. It also traces the recent efforts to forge a unified black identity among a diverse group of individuals representing the African Diaspora. To accomplish this, I focus on the three main groups of actors involved in Black political organizing in Buenos Aires: organizations representing nation states (embassies, federal organizations, and city offices in Buenos Aires), Afro-descendant organizations, and African organizations. Most works that examine the politicization of Black identity among Afro-descendants in Latin America focus on the activities of the native population of Afro-descendants and the effects of their leadership efforts (Rivera-Rideau, Jones, and Paschel 2016, Dixon and Burdick 2012, Caldwell 2007). I focus on the activities of foreign-born Africans and Afro-descendants in addition to Afro-Argentines to understand how they shape understandings of what it means to be Black in Argentina.

Research objectives and methods:
The objectives of this research are to 1.) document evidence of Black political activism in Argentina and preserve this important material for the historic record and 2.) to contest the mythology of Black disappearance and invisibility in Argentina. I will accomplish this through interviews with activists, scholars, and other community members who possess material related to Black political organizing in Argentina. The interviews will help me better understand the archival materials. I will also photograph and scan photos, flyers, newspaper articles, conference programs, and posters during these interviews. These will be analyzed at a later date and used to corroborate with the ethnographic evidence provided in my book.

Project within the larger context of anthropology
This chapter is the third of five chapters in my first book which will be one of the first ethnographies on Black people in present-day Argentina. Questions of race and identity are at the center of a large number of studies within cultural anthropology. The majority of the research on Afro-descendants in Argentina is in the realm of history which inadvertently serves to reify the mythology of the disappearance of Black people in the nation (Adamovsky 2013, Geler 2010, Frigerio 2013, Guzmán 2013). Furthermore, there have been few opportunities to hear the voices of Africans and Afro-descendants residing in the nation (Molina 2001, Lewis 1996, Pita 2012). The proposed ethnography will provide an opportunity to hear an analysis of present-day racial politics in Argentina from the perspective of these individuals and make much-needed anthropological contributions to Afro-Latin America American Studies.

Purpose and significance of the project
I am one of the few CUNY scholars whose research focuses on Argentina, and part of a small handful of Afro-Latin Americanists at BMCC. Since the late 1990s, Afro-Latin America has grown to become its own separate research body. As a fairly recent area of scholarship, little research exists on Black populations in the Southern Cone. My work offers a much-needed contribution to the study of Black social movements in the Americas. This research has a direct connection with the lived experiences of BMCC students, many of whom are Black and Latinx.

It also supports the college's commitment to fighting racism, and the increased involvement of our community in activism. Ultimately, the ethnography in which the chapter described appears will be a useful tool for activists, researchers, students, and the general public.

Argentina represents an extreme case of the invisibilization of Afro-descendants in Latin America as it was one of the most successful countries in using whitening policies for nation building (Andrews 2004). In the majority of the region national myths are centered on a version of *mestizaje* or racial mixing resulting in people of mixed backgrounds. Argentina, on the other hand, has constructed its myth of origin to not only center whiteness but almost completely erase all other contributions such that racial mixture results in a virtually all White population (Geler 2016). In this text I provide a new framework for how race operates in Latin America outside of the popular understandings of *mestizaje*.

Qualifications of the researcher

I am one of an extremely small handful of scholars with expertise on Africans and Afro-descendants in present-day Argentina and have over fifteen years of research experience in the country. This has allowed me to build strong long-term relationships with those involved Black political organizing. This includes collaborations with local Africans and Afro-descendants on numerous projects, publications, and presentations both in Argentina and the U.S. In 2020 I co-founded the Organización Afrodescendiente para la Asistencia Jurídica y Formación (OAFRO), Argentina's first Black legal aid organization. My fluency in Spanish will assist with my interviews. Additionally, the embodied knowledge I gained as a Black woman living and studying in the nation contributes to the richness of my analysis.

Outputs and enhanced professional development

This research project will result in the book chapter "Searching for Black People in a White Nation." As it will be part of my first book, I need to provide a completed draft of each chapter before submission of the proposal. In addition to the book chapter, I will share the results of my project in a public presentation for the BMCC community. The book will also aid in my promotion to full professor. As Ethnic and Race Studies is a new department, we need more full professors to help lead the department and ensure the growth of the new major.

Timeline:

June 2022: Submission of IRB application and Intent to Travel form
July 2022-Aug. 2022: Trip to Buenos Aires for interviews and collection of archival materials
Sept. 2022-Oct. 2022: Writing of first draft of chapter
Nov. 2022: AAA Conference – presentation of chapter
Dec. 2022-Jan. 2023 - Write-up of final draft chapter
Feb. 2023-Apr. 2023: Finalize drafts of remaining chapters
May 2023: Submit book proposal to presses with all chapters fully drafted

Budget:

$900 Roundtrip airfare to Buenos Aires
$600 Housing for 1 month in Palermo neighborhood
$1500 Meals ($50/day)
TOTAL: $3,000

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Breast Cancer Diagnosis Using Artificial Intelligence

Project Narrative

Introduction About 13% of women in the US will contract invasive breast cancer in their lifetime [1]. The prognosis of recovery is significantly improved with an early diagnosis of the disease. Thus, screening tests such as mammogram and magnetic resonance imaging are recommended. Mammogram is an X-ray image of the breast and the initial diagnosis is made based on the abnormalities visible in these images. Traditionally two or more experts examine carefully mammogram image, identify problematic areas and doctors perform additional diagnostic, for example, biopsy if necessary. Examination of biopsy results are done again by experts. Although human expert is more flexible to find cancerous masses and cells, he or she can make a mistake, and overdiagnosis is more common resulting in unnecessary testing and/or procedures. Additional observation of images is time consuming for human experts, and it lengthens the time required for diagnosis and decision making. Having an automated system that would identify potentially malignant abnormalities would help the experts and reduce the time for patients anxiously waiting for their results. Artificial Intelligence (AI) technology is being incorporated into more areas of research and everyday life. We are now in the third booming period of AI. One of major fields of AI is machine learning (ML) [2]. ML technology can make a quicker decision than human with predictable accuracy of the decision-making processes. There are two categories of ML methodologies in medicine: feature-based method and image-based method. Data for the former are features extracted by experts or software from various sources including mammogram images, while data for the latter are medical images themselves and features are directly extracted from the images mostly by experts. ML algorithms are grouped in two categories: unsupervised one (K-means, principal component analysis PCA, etc.) and supervised ones (Support Vector Machine SVM, Decision Tree DT, Adaboost, Random Forest RF, eXtreme Gradient Boosting XGB etc.). The description of each algorithm can be lengthy for a short proposal, so I will later show examples of two algorithms to classify three iris species using petal length and width. In classification problems like the proposed research (classification of each case/sample as malignant or benign), an unsupervised algorithm needs, a priori, no answer for each case (sample), while a supervised algorithm needs the answer for each case during a training session with training data. Once the training of an algorithm is done with training samples, a model is made for the algorithm, and it is applied to statistically independent test samples. Among algorithms based on neural networks derived from functioning of nervous system, deep learning neural networks have a greater number of intermediate hidden neuron layers between the image input and the output layer for the decision on whether malignant or benign – thus they are called deep learning algorithms (DL). DL algorithms are suited to analyze images and classify each as malignant or benign. In this proposal I call non-DL algorithms as ML ones as opposed to DL ones. I propose to use ML algorithms for a dataset of geometrical features of suspicious cells taken from patients who had suspicious mass growth in their mammograms to diagnose whether they are malignant or benign. I also plan to use DL algorithms to diagnose suspicious regions of interest on patients' mammograms whether they are malignant or benign. In the end I will evaluate performance of each algorithm.

*Analysis of feature-based data (**W**isconsin **B**reast **C**ancer **D**iagnostic data WBCD)* I will use the data collected and deposited for the public use by W. Wolberg et al. (known as WBCD) [3]. This dataset provides 30 features or characteristics of nuclei of cells extracted from images of biopsy result using fine needle aspirate technique (Fig.1). In Fig.1 the regions marked by white lines are

nuclei of cells. These features, such as the average radius of the perimeter, the area, and the degree of symmetry of a nucleus etc., are measured by a computer program. The WBCD includes information of whether the sample is taken from patient diagnosed with or without breast cancer. These data have been used by many researchers since 1995 when they were put in public domain. In these data there are 212 labelled samples of malignant cells and 357 labelled samples of benign cells. Therefore, this data-set is a so-called imbalanced data set in the population of two categories. Note that the WBCD does not have information about the participating patients – thus no approval from IRB is needed.

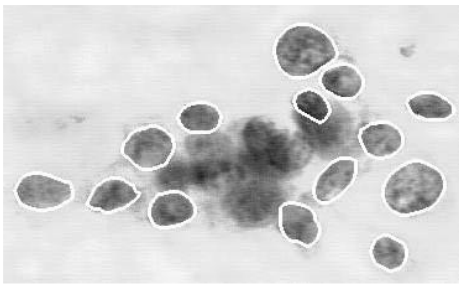

Fig.1: Nuclei from suspicious cells

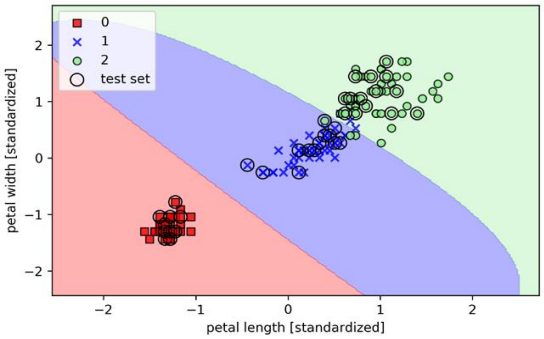

Fig.2 (a): Classification by Support Vector Machine

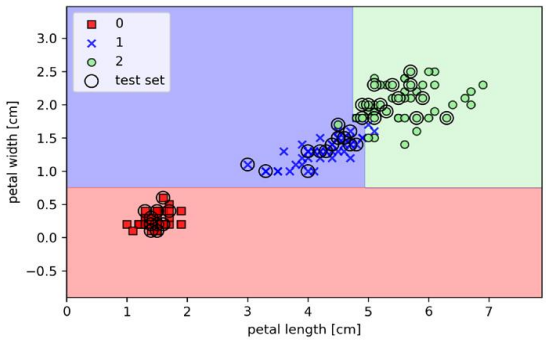

Fig.2 (b): Classification by Decision Tree

I will use supervised machine learning algorithms listed earlier and plan to find which algorithms perform better using a rigorous statistical analysis that are very often missing in the literatures. Fig.2 shows the classification of three species of iris flowers (0,1 and 2) using two features, the petal width and length, by the Support Vector Machine (SVM) algorithm (a), and that by the Decision Tree (DT) algorithm (b). As you see the two algorithms use different approaches but are equally successful. The SVM algorithm tries to classify samples in such a way that the distances to the classification boundaries from each sample in different classes are maximized. The DT algorithm starts from the whole samples, and then, depending on the answer for a Yes-No question whether one feature value of each sample is bigger than a value, it splits the whole samples into two (branches). Then at the next step, it asks another Yes-No question and splits the samples in each branch into two more branches. This process continues until a certain condition is met. The DT algorithm is the base of other algorithms such as RF, Adaboost, and XGB that are more refined. I will use a popular computer language python and at least two python packages for machine learning (scikit-learn) and statistical analysis (scipy). I will use at least two important metrics to gauge performance of each algorithm: True Positive Rate (TPR) - how often a given algorithm diagnoses correctly malignant cell, and False Positive Rate (FPR) - how often a given algorithm mis-diagnoses benign cell as malignant.

*Analysis of **D**igital **D**atabase for **S**creening **M**ammography DDSM and its variant)*

The second public dataset I plan to use is a subset of the Digital Database for Screening Mammography (DDSM), a collection of mammogram images maintained by University of South Florida [4]. The subset of the DDSM data (CBIS-DDSM) was created after pre-processing the

original images [5]. I will analyze the CBIS-DDSM for my research. This dataset is pre-processed by extracting regions of interest (ROI) which seem to contain abnormal tissues in DDSM. This dataset comes with the label/class (malignant or benign) for each image. For image analysis, Deep Learning (DL) is better suited as modern DL is designed to excel in the field of image analysis. Fig.3 shows a benign (a) and a malignant mass example (b) from CBIS-DDSM. This dataset is in the public domain and there is no need for IRB approval. The plan is to use some of many DL algorithms, in particular, autoencoder (AE) shown in Fig.4. For a given mammogram image, AE first compresses information with the encoder, and stores it in the middle of the network (bottleneck). AE then tries to reconstruct the original as accurately as possible with the decoder from the information (latent features) in the bottleneck. If the reconstruction is successful the latent features in the bottleneck has sufficient information to classify whether the given image represents that of malignant or benign using, for example, ML algorithms I described earlier. After training with the training dataset, comparing the label attached to the original image for testing with the classifier result, the effectiveness of the algorithm can be assessed. Once the training is done, AE remembers how to make a decision correctly on a new mammogram image (malignant vs. benign). Another advantage of AE is that reconstructed images can be used as if they were new images. This technique is called augmentation and is widely used in the community to increase the amount of data available.

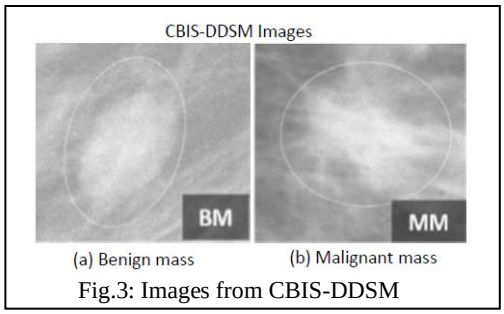

Fig.3: Images from CBIS-DDSM

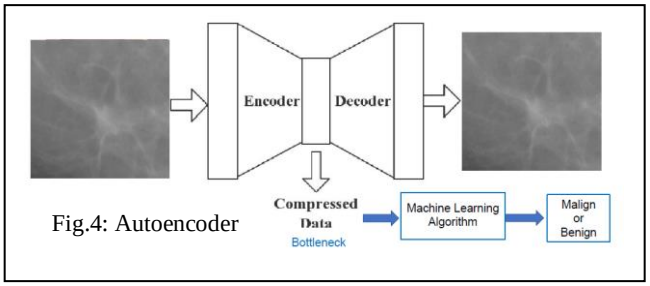

Fig.4: Autoencoder

Purpose and Significance of Proposed Research The goals of the proposed project with WBCD are as follows: (1) using free software (although there will still be a lot of coding to do) if I achieve good results, medical practitioners can save a large expense and more patients' lives; (2) with rigorous statistical analysis I plan to correct oft-claimed unwarranted statements about certain ML algorithms and to figure out which algorithm is really the best; (3) and I plan to investigate carefully possible bias introduced by the imbalanced population in which the number of benign samples and that of malignant samples are imbalanced. The goals of the project with CBIS-DDCM are: (1) to develop an efficient DL based algorithm (autoencoder etc.) for breast cancer diagnosis with mammograms image; (2) and to do proper statistical analysis on the result. I believe the proposed project will lead to a possible step to realization of efficient automatic yet robust detection protocol of breast cancer, which will save many lives in the future by early detection of the sign of breast cancer. The research will expand and broaden my experience with AI.

My Qualification In my field of research it has been increasingly popular to use machine learning algorithms to pick up signal from much larger background. Recently a group of researchers I lead submitted a paper on a novel deep learning algorithm to analyze images captured by an electric detector, and the paper was accepted for publication. Therefore, I am well qualified for the proposed research.

Dissemination Plan I plan to publish the outcome of the proposed work in one of respected peer reviewed journals such as PLOS ONE and IEEE Access, and also to deposit all the python codes developed at the GitHub website for the public use. I will also deposit my paper at bioRxiv.

Timeline

I have been working on the first part of the project with the WBCD dataset for over a year, and two students presented the preliminary results at Metropolitan Association of College and University Biologists (MACUB) meeting in Fall 2021. I have reached a stage where I need more computer power to run my codes. For the second part of the project with the DBIS-DDSM dataset, I will need powerful Graphic Processing Units (GPUs) to run codes for deep learning that demand heavy matrix calculations which GPUs are good at. Thus, it is essential for me and an assistant who has a knowledge of computer science to have access to the Google Colaboratory Service that allows us to use the cutting-edge GPUs at relatively low cost.

Dates	Plan
07/01/2022	Continue to develop python codes for the analysis with the WBCD dataset, and to analyze the dataset. Start developing python codes to analyze the DBIS-DDSM dataset
08/31/2022	Continue a series of the analyses of the WBCD and DBIS-DDSM datasets
11/01/2022	Start compiling the analysis results
01/01/2023	Start writing a research paper
03/01/2023	Finish and submit the paper to a journal and prepare for the final report
06/01/2023	Submit the final report

Budget

1. Subscription fee for Google Colaboratory for me and an assistant $1,400 (1 year) to develop and run python codes of deep learning algorithms on powerful Graphic Processing Units (GPUs) available from the service for the proposed research (Colab Pro+ $600/yr x 2 + 2-TB Google Drive disk space for $100/yr x 2 = $1,400)
   (See https://colab.research.google.com/signup for subscription fee for Google Colab, and https://one.google.com/about/plans Google Drive disk space fee)
2. Publication fee $1,600 (for example, Plos One fee $1,805 or IEEE Access fee $1,850)
   (See https://plos.org/publish/fees/ for Plos One, https://open.ieee.org/for-authors/article-processing-charges/ for IEEE Access)
3. Total Budget: $3,000

Bibliography

Note: It is not necessary to take a look at these references to review the project narrative. However, I provide them as references that might help understand my proposal deeper.

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[2] https://en.wikipedia.org/wiki/Machine_learning; Also for example, Raschka, S. and Mirjalilli, V., Python Machine Learning, 2019, Packt Publishing
[3] Wolberg, W., Street, W. N., and Mangasarian, O. L., available at http://archive.ics.uci.edu/ml/datasets/Breast+Cancer+Wisconsin+(Diagnostic), also references therein.

[4] http://www.eng.usf.edu/cvprg/Mammography/Database.html
[5] https://wiki.cancerimagingarchive.net/display/Public/CBIS-DDSM
Lee, R. S. et al., Nature Scientific Data 170177 (2017)