Post: Research Fellow in Acoustic Signal Processing and Machine Learning

Ref: 050920

Application ID: 91199

Submitted: 03/01/2021

Personal Details

Forenames: Iyalla JOHN

Title: Mr

Home address:
55 RAMSDEN COURT
MILFORD STREET
HUDDERSFIELD
WEST YORKSHIRE
HD1 3DY
United Kingdom

Surname: Alamina

National Insurance Number: SR442534C

Email: john.alamina@hud.ac.uk

Telephone Number:

Mobile Number: 07459136287

Work Number:

Permission to Work:
I will require a Certificate of Sponsorship to work in the UK

Education and Professional Development

Education

No details provided by applicant

Highest Qualification Held: Other higher degree

Other: MASTERS OF SCIENCE - ENGINEERING CONTROL SYSTEMS AND INSTRUMENTATION

Current membership of professional and / or scientific bodies

No details provided by applicant

Current/Most Recent Employment

Employer's Name: STUDY GROUP

Location: UNIVERSITY OF HUDDERSFIELD

Salary:

I currently work at the University: No

Job Title: COMPUTING TUTOR

Start Date: 03/2020   **End Date:**

Other Benefits:

Employment Status: Part Time

Brief Description of Duties:
TEACHING OF SOFTWARE DESIGN AND C++ FOR FOUNDATION AND YEAR 1 STUDENTS

Reasons For Leaving: CAREER PROGRESSION   **Notice Period:** 1 MONTH

Previous Employment

No details provided by applicant

Supporting Statements

1. Qualifications and Experience (essential to the job)
Please detail your doctoral level (or equivalent) research and development experience in electronic engineering, computer science or related subject.

Automatic Speech Recognition (ASR) has made major leaps in its advancement largely due to two different machine learning models: Hidden Markov Models (HMMs) and Deep Neural Networks (DNNs). State-of-the-art results have been achieved by combining these two disparate methods to form a hybrid system. This also requires that various components of the speech recognizer be trained independently based on a probabilistic noisy channel model. Although this HMM-DNN hybrid ASR method has been successful in recent studies, the independent development of the individual components used in hybrid HMM-DNN models makes ASR development fragile and expensive in terms of time-to-develop the various components and their associated sub-systems. The resulting trade-off is that ASR systems are difficult to develop and use especially for new applications and languages.

The alternative approach, known as the end-to-end paradigm, makes use of a single deep neural-network architecture used to encapsulate all the sub-components of speech recognition as a single process. In this end-to-end paradigm, latent variables of sub-components are subsumed by the neural network sub-architectures and the associated parameters. The end-to-end paradigm gains of a simplified ASR-development process again are traded for higher internal model complexity and more computational resources needed to train the end-to-end models.

My Ph.D. research focus was on taking advantage of the end-to-end model ASR development gains for new and low-resource languages. Using a specialized lightweight convolution-like neural network called the deep scattering network (DSN) to replace the input layer of the end-to-end model, our objective was to measure the performance of the end-to-end model using these augmented speech features while checking to see if the lightweight, wavelet-based architecture added any new features that are beneficial for low resource Speech recognition.

The results showed that it is possible to use this compact strategy as an alternative for speech features required for speech pattern recognition by deploying deep scattering network features with higher dimensional vectors when compared to traditional speech features. With WERs of 26.8% and 76.7% for SVCSR and LVSCR respective tasks. The \acrshort{asr} system metrics fell few WER points short of the respective baselines. In addition, training times tended to be longer when compared to the respective baselines.

2. Project / Research Work (essential to the job)
Please detail your project and/or research experience in audio signal processing and machine learning, and acoustic data collection.

I have done extensive work in Audio signal processing and speech pattern recognition at the Ph.D. level and also general 1D and 2D signals both at the Masters and Ph.D. level.

3. Project / Research Work (desirable for the job)
Please detail your research experience in one or more of the following areas: machine learning; audio signal processing, acoustic source detection, acoustic source localization, sound classification, feature extraction, time-frequency analysis, convolutional neural networks, recurrent neural networks, and acoustic data capture with microphones.

I have worked with RNNs and CNNs for audio speech classification and surface fault detection in machined products respective. Work in speech recognition also involved neural network integration of noise-robust feature engineering using a microphone array.

4. Project / Research Work (essential to the job)
Please detail your skills and experience in developing new research algorithms or methods, using languages such as Python, C++ and/or MATLAB, with relevant signal processing and/or machine learning tools, and your experience in data collection.

I have been exposed to deep learning development using Python, C++, and MATLAB. Most of my Ph.D. level work was done with Python and Most of my Master's level work was developed in C++. I also did a substantial amount of signal processing, signal feature engineering, and deep neural network development at the Masters and Ph.D. level using MATLAB.

5. Communication (desirable for the job)
Please give examples of how you have demonstrated your ability to communicate research to audiences at different technical levels.

I have been able to present my Ph.D. level research at the UKSpeech conference and as a teacher I regularly teach C++ and software design.

6. Research Publications (desirable for the job)
Please list the publications that you have in refereed journals and conferences in the past 5 years. [Even if this information is also on your CV, it will help us with our shortlisting process if you copy it into the box below.]

I do not have any publications but I do have a number of publications that are being prepared for publication including my thesis title:

1. Deep scattering features for end-to-end Automatic Speech recognition
2. A recurrent neural network language model for the Wakirike Language

Referees

Reference 1

Type: Course Tutor

Name: Professor Andrew Longstaff

Position: Professor of Machine Tool Metrology

Address:
Department of Engineering Technology
School of Computing and Engineering
University of Huddersfield
Huddersfield
West Yorkshire
HD1 3DH

Email: a.p.longstaff@hud.ac.uk

Telephone Number:

Can referee be contacted without prior permission: Yes

Reference 2

Type: Phd Supervisor

Name: Dr David Wilson

Position: Senior Lecturer

Address:
Department of Computer Science
University of Huddersfield
Queensgate
Huddersfield
West Yorksire
HD1 3DH

Email: d.r.wilson@hud.ac.uk

Telephone Number:

Can referee be contacted without prior permission: Yes

Criminal Records Disclosure

The information provided in this section is stored separately from your application form to protect confidentiality. Any details that you have provided will be treated in the strictest confidence and will not automatically exclude you from being considered for this or any other vacancy.

Have you any unspent criminal convictions in line with the Rehabilitation of Offenders Act 1974? No

Equality of Opportunity

For monitoring our HR processes, data will not be transfered to any third party and will not be used in a way that allows individuals to be identified.

Sex: Male

Date of birth: 05/11/1979

Gender identity is the same as the gender originally assigned at birth: Yes

Nationality: UNITED KINGDOM

Marital Status: Married

Sexual Orientation: Heterosexual

Religion: Christian

Ethnic Origin: Black or Black British - African

Consider to have a disability, impairment, health condition or learning difference: No

Recruitment Source

Where did you learn of this job:
UKSpeech Bulletin