

IOA Diploma best final project course 2022-23 at London South Bank University, receives NTI-Audio award

by IOA Diploma course director Dr Luis Gomez-Agustina at London South Bank University. 20 February 2024.

As it is customary at the IOA January London Branch meetings, some of the best IOA Diploma student final projects undertaken at the London South Bank University (LSBU) are presented by their authors

In addition, the NTI-Audio LSBU IOA Diploma Student Final Project award ceremony takes place also during the January London Branch meetings.



Above: (L-R) Charles Greene, Dr Luis Gomez-Agustina, and Rebecca Page

This competitive award was set up in 2019 in collaboration with the sponsor of the award, acoustics instrumentation manufacturer NTI-Audio, to recognise and celebrate excellence of final Diploma projects at LSBU.

This year's meeting took place on 17 January 2024 in-person and also was streamed online to remote attendees. It has marked the sixth anniversary of this successful award event. The hybrid meeting was well attended by a mix of senior consultants, academics, acoustics students and alumni.

The two shortlisted finalists of the class 2022-23 for the award were: Rhiannon Hawkins on *Acoustic design of heritage school buildings* and Rebecca Page on *Impact Noise and Vibration Induced by Deadlifts*. Unfortunately Rhiannon could not attend the award ceremony due to bad health on the day of the event.

Rebecca Page presented her investigation into the noise and vibration induced by impacting deadlifts in gymnasiums. She started by noting that as the UK Health and Fitness industry continues to grow, it is vital to understand how gym activities can induce noise and vibration. Of particular importance, is the contribution to noise-induced hearing loss (NIHL) caused by impacting deadlifts. In a literature review she found that there was very limited research investigating this subject. Most of those related studies used smartphone applications to collect data, which is a contested resource for these type of investigations.

The study aimed to characterise the noise and vibration emissions caused by impacts during weightlifts in a typical gym. The research work also intended to assess the validity of a smartphone application to measure noise and vibration level cause by the impacts.

The acoustics and vibration experimental tests took place at a large residential gym. A professional calibrated acoustic analyser and vibration meter as well as a smartphone application were employed for the data collection. The deadlifts were performed by a professional personal trainer. The weights employed ranged between 20kg and 70kg. For each weight, there were three drops on the gym floor and three drops on an extra 15mm rubber mat over the flooring. By adding an extra mat, considerations to damping vibrations and impact on sound levels were made.

Rebecca's study found there was no definitive correlation between noise levels and deadlift weight impacts. This was because plate numbers and composition added to the barbell were deemed influential factors over noise. Consequently, the extra 15mm mat had no influence on impact noise levels, as the mat was unable to prevent the plates colliding together. In comparison, there was a proportional relationship between deadlift weight and vibration levels. Thus, it was found that the mat was successful in reducing vibration levels.

By measuring with both sound level equipment and smartphone applications, this study concluded smartphones were inaccurate and unreliable to measure sound and vibration. This was because the noise measurements performed by the smartphone application were underestimated, while the vibration measurements were unsuccessful.

After the presentation, Rebecca took a good number of questions from the interested in person and online audience.

Charles Greene, General manager of NTI-Audio UK and Luis hosting the event, presented the award trophy to the winner of the competition, Rebecca Page, who gladly accepted the award. On announcing the winner Charles commented on the consistent high standard observed every year on the finalist projects.

LSBU and the IOA are grateful to Charles Greene and NTI-Audio for the continuous support to the IOA Diploma at LSBU and sponsorship of the award.

Congratulations to Rebecca and to the other shortlisted student Rhiannon Hawkins. We wish you all the best for the future.

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<https://www.lsbu.ac.uk/courses/course-finder/acoustics-diploma>

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