Andre A. M. Munoz

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Personal Statement

A professional with a background in physics seeking a role in science, engineering or research. Transferable skills include the ability to learn quickly, innovative thinking, and problem-solving; which is demonstrated below. Willing to relocate for a promising job role given that a relocation package is available.

Work Experience

Jan 2020 - Present **Freelance Photographer/Videographer, Aerial Andre Ltd, U.K**

• Travelling and exploring various locations, capturing the moment through digital photography and film making. Captured content is then used on a monetised YouTube channel, and sold via stock photography agencies.
• Providing photography and videography services to Eversotasty (a YouTube cooking channel), which includes framing, filming and video editing.

May 2019 - Jan 2020 **Threat Detection Physicist, Dstl, Porton Down, U.K**

• Worked on classified government projects as part of the Contraband & Threat Detection (CTD) team under the Policing and Security Group (PSG), which formed part of the Counter Terrorism and Security (CTS) division at the Defence Science & Technology Laboratory [dstl]. The role involved researching and consulting government agencies on transport security, travel threats and security measures using cutting edge screening technology.
• Provided support in scoring threat detection capabilities of X-ray screening machines, such as the SureScan x1000 to determine if they meet the European Civil Aviation Conference (ECAC) standards. This involved safely working with real explosives at the EPC-UK secure test facility on Bramble Island in Harwich Essex.
• Created a GUI program using MATLAB to characterise unknown material, such as explosive simulants. This was achieved by analysing CT images of known samples to determine the 'CT' number. The 'CT' numbers were used along with electron densities to interpolate values for unknown samples, subsequently, allowing sample material to be characterised.

Jan 2015 - Dec 2018 **Graduate Researcher, Cranfield Forensic Institute, Shrivenham, U.K**

• Manifested theoretical concepts to production by designing, constructing, testing and evaluating a prototype near-field X-ray backscatter imaging system using coded masks. This included in-depth research into X-ray 'optics' and photonics for defence and security applications.
• Applied innovative thinking through rapid prototyping to provide a low-cost alternative to coded mask imaging. This could eventually find applications in medical radiography, industry and defence and security.
• Used extensive knowledge of the MATLAB programming language to write signal processing algorithms for image reconstruction, by applying cross-correlation and blind deconvolution.

May 2013 - Sep 2013 **Internship, University College London, London, U.K**

• Assisted in novel research designing, testing and installing a fiber optic spectrometer to a telescope, eliminating unwanted imaging effects from the flexure of a CCD extension tube.
• Involved as part of a team planning, organising and cataloguing literature. The project took place at University London Observatory in Mill Hill with the purpose of creating a library to assist students in their studies and research.

Education

Jan 2015 - May 2019 **Ph.D in Applied Physics, Cranfield University, Shrivenham, U.K**

• **Thesis Title:** 'Imaging Near-Field Backscattered X-Rays using Pinhole and Coded Masks'
• **Project:** Worked on a classified government-funded (dstl) project investigating coded mask 'optics' for X-ray backscatter imaging at the Defence Academy of the United Kingdom.

Sep 2009 - Jul 2014 **BSc. (Hons) Astrophysics, [2:1], Aberystwyth University, Wales, U.K**

• *Transferred from Open University in 2012.*
• **Thesis Title:** 'Impact Flashes on the Moon: Cosmic Ray Analysis'
• **Modules:** Data Handling & Statistics, Mathematical Physics, Experimental Physics, Quantum Mechanics, Thermal Physics, Probing Atoms & Molecules, Electromagnetism, Condensed Matter, Cosmology, Planetary Atmospheres and Solar Interior.

Summary of Skills

- **IT & Programming** Confident user in Microsoft Windows, MacOS, Linux and Microsoft Office suites. Experienced in using MATLAB to write image processing algorithms and a GUI .exe material characterisation program. Also a confident user of LaTeX to write technical documents.
- **Engineering** Experienced in 3D printing and rapid prototyping to fabricate high density X-ray 'optics' and manufacturing tertiary alloys. I have also designed and various components for X-ray imaging systems using SOLIDWORKDS.
- **Trouble Shooting & Maintenance** Trouble shooting and equipment maintenance was part of my routine, having designed an X-ray imaging system from scratch. Results were achieved through systematic tests or novel means of manufacturing custom parts from our in house workshop. Trouble Shooting was also a major component of my role at dstl, as strict security measures would not allow engineers from some manufacturers or countries on MoD sites.
- **Project Management** Aided the direction of a government-sponsored Ph.D project which included, time management, experimental planning, and supervising interns and students participating in MSc programs.
- **Innovative Thinking** Derived novel solutions and published the findings in journal manuscripts and conference proceedings. Examples include using alloy casting to rapid prototype high density X-ray optics.
- **Problem Solving** Introduced cold casting 3D printing to manufacture coded masks with self-supporting structures providing a low-cost alternative to coded mask imaging. Also, developed a material characteristic .exe program for staff at dstl, which could be used to detect simulant security threat related substances.
- **Laboratory Skills** Experienced in working in radiation cells to chemistry labs and within a forensic environment. Also, this includes working in highly secure military environments with firing ranges and explosive test sites. Additionally, I have experience with the following equipment (but no limited to); SureScan X1000 and Hi-Scan 6046si X-ray baggage scanners, Nuctech LS1516 CT scanner and a prototype AS&E X-ray backscatter imaging system. Also, I am trained in assessing risks and writing assessments.

Extracurricular Activities & Interests

- **Memberships** Associate member of the Institute of Physics.
- **Achievements** Full clean car license, motorcycle license and professional Association of Diving Instructors (PADI) open water certificate.
- **Interests** Keen recreational drone pilot, photographer and videographer. Travelling is my other passion with destinations to mainland Spain, Majorca, Canary Islands, Portugal, Italy, Morocco, Thailand, Cuba, Jamaica, Iceland, U.S.A, Canada and within the UK. Other interests include cooking a wide range of dishes which can be seen on www.eversotasty.weebly.com

Journal Publications

Andre A. M. Munoz, Anna Vella, Matthew J. F. Healy, David W. Lane, Ian Jupp, David Lockley, (2018), *"Low open fraction coded masks for x-ray backscatter imaging"*, Opt. Eng. 57(9), 093108 , doi: 10.1117/1.OE.57.9.093108.

Andre A. M. Munoz, Anna Vella, Matthew J. F. Healy, David W. Lane, Ian Jupp, David Lockley, (2018), *"Rapid prototyping-coded masks for x-ray backscatter imaging"*, Opt. Eng. 57(8), 085104 , doi: 10.1117/1.OE.57.8.085104.