Richard S. Whittle

PhD Candidate · Department of Aerospace Engineering

Texas A&M University, 3141 TAMU, College Station, TX 77843

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Education

Texas A&M University — *College Station, TX*

Doctor of Philosophy in Aerospace Engineering — *TBC 2023*

- **Dissertation:** Quantifying the effects of altered-gravity and spaceflight countermeasures on acute cardiovascular and ocular hemodynamics
- **Committee:** Profs A Diaz Artiles *(Chair)*, BJ Dunbar, CR Woodman, DC Zawieja, JC Buckey Jr
- **Cumulative GPA:** 4.0

Cranfield University — *Cranfield, UK*

Master of Science in Astronautics and Space Engineering — *Nov 2017*

- **Thesis:** Lunar EVA Emergency Pressurisation (LEEP) Shelter: Concept Design Using a Systems Engineering Approach

Stratford Business School — *London, UK*

Post Graduate Diploma in Strategic Management and Leadership — *Aug 2017*

University of Cambridge — *Cambridge, UK*

Master of Arts — *Mar 2014*

University of Cambridge — *Cambridge, UK*

Master of Engineering in Engineering — *Jul 2011*

- **Thesis:** Computer Aided Design of Mixed-Signal CMOS VLSI Circuit
- **Specialization:** Electrical and Information Sciences

Professional Education

International Space University — *Cork, Ireland*

Space Studies Program — *Aug 2017*

Massachusetts Institute of Technology — *Boston, MA*

Professional Certificate in Architecture and Systems Engineering — *Mar 2017*

Chartered Management Institute — *Corby, UK*

Level 5 Extended Diploma in Management and Leadership — *Jun 2016*

Royal School of Military Engineering — *Chatham, UK*

Royal Engineers Commanders' Course — *Nov 2015*

Institute of Leadership & Management — *Tamworth, UK*

Level 5 Diploma in Leadership and Management — *Apr 2015*

Royal Military Academy Sandhurst — *Camberley, UK*

Regular Commissioning Course — *Dec 2013*

Royal Military Academy Sandhurst — *Camberley, UK*

Territorial Army Commissioning Course — *Jul 2009*

Research

Research Experience

Texas A&M University - Bioastronautics and Human Performance Laboratory *College Station, TX*

Advisor: Prof. Ana Diaz Artiles *2018 - Present*

- **Dissertation:** *Predicting acute cardiovascular and ocular changes due to changes in the gravitational vector and effects of countermeasures*. Experimental and computational analysis of physiological responses to altered gravity, lower body negative pressure, and centrifugation. Focus on cephalad and ocular hemodynamics and their relationship to spaceflight associated neuro-ocular syndrome (SANS).
- **Other Research Projects:**
  - Developing an artificial intelligence virtual assistant for anomaly treatment in long duration exploration missions.
  - Using virtual reality to increase exercise motivation and performance when following the NASA SPRINT Protocol.
  - Monitoring psychological changes in analog astronauts.
  - Modeling cardiovascular changes on long duration spaceflight.
  - Modeling cardiopulmonary systems.
  - Development of Bayesian spatial models to predict socioeconomic determinants in the spread of COVID-19.

International Space University *Cork, Ireland*

Advisors: Mr. Joseph Pellegrino, Mr. Robert Gevargiz, Prof. Ana Diaz Artiles *2017*

- **Team Research Project:** *The Internet of Things and future applications for energy and space*. Providing space and energy industries an influential roadmap on how to apply IoT technologies, covering applications in Earth observation, remote platforms, interplanetary missions including asteroid mining, and the energy sector.
- **Individual Research Project:** *Monitoring EVA performance and suit capabilities with an integrated sensor suite*. Concept for augmenting future EVA suits with a wirelessly networked suite of biosensors linked to augmented reality using spin-in technology from military aviation and commercial wearable devices.

Cranfield University - School of Aerospace, Transport, and Manufacturing *Cranfield, UK*

Advisors: Prof. David Cullen, Dr. Peter Hodkinson *2016-2017*

- **Thesis:** *Lunar EVA Emergency Pressurisation (LEEP) Shelter: Concept Design Using a Systems Engineering Approach*. Full systems design of a novel concept for deployable shelters for emergency use in Lunar exploration.
- **Group Project:** *Deep Space Habitat*. Concept design for a proposed space station at the Earth-Moon L4/5 Lagrange point.
- **Other Research Projects:** *Medical requirements for a short term/established lunar base*. Research as part of a joint panel with the European Space Agency (ESA) titled "Designing a Roadmap for Moon medical capabilities" with the intention of informing future strategy on the ESA Director General's Moon Village vision.

British Army *UK*

Advisors: Maj. Craig Seller, Maj. Paul Mort, Dr. Ali Parchami, Prof. Lloyd Clark. *2012-2016*

- **Professional Research Projects:**
  - *Geographic Information Systems*. Quantitatively assessing the characteristics of a region of Ethiopia near the South Sudanese border in order to identify locations which should be considered further for refugee camp siting.
  - *Recruit Injury Study*. Examining the rates and types of injuries amongst soldiers undergoing basic infantry training. Results were used to inform a scientifically supported redesign of the training program, leading to a 10% increase in first time pass rate of recruits.
  - *Syria Civil War Study*. Policy analysis of state and non-state actors with a strategic stake in the Syrian Civil War.
  - *UNAMIR Lessons Learned*. Post-hoc analysis drawing recommendations from strategic, operational, and tactical failures, that rendered the United Nations unable to prevent the Rwandan genocide.

University of Cambridge - Department of Engineering *Cambridge, UK*

Advisor: Dr. David Holburn *2010-2011*

- **Thesis:** *Computer Aided Design of Mixed-Signal CMOS VLSI Circuit*. VLSI design of a NAVTEX BFSK homodyne radio receiver as a single, mixed-signal, 'system on a chip'.

Awards, Fellowships, & Grants

2022 **Human Research Program (HRP) Augmentation Grant**, NASA *$25,000*
Funding for short-term investigation to augment existing HRP-funded grant for doctoral research.

2021 **AERO Graduate Excellence Fellowship**, Texas A&M University *$1,000*
Awarded by the Department of Aerospace Engineering for excellent academic achievement.
AERO Graduate Excellence Fellowship, Texas A&M University *$20,000*
Awarded by the Department of Aerospace Engineering for excellent academic achievement.
AERO Graduate Excellence Fellowship, Texas A&M University *$1,000*
Awarded by the Department of Aerospace Engineering for excellent academic achievement.

2020 **AERO Graduate Excellence Fellowship**, Texas A&M University *$1,000*
Awarded by the Department of Aerospace Engineering for excellent academic achievement.

2019 **Travel Award**, Texas A&M University *$1,000*
Awarded to present paper at the IEEE Aerospace Conference 2020.
Winner - Best Poster, Paving the Road to Living in Space Conference *€100*
First place in the poster competition.

2018 **The Vice Chancellor's Prize 2018**, Cranfield University
Awarded to the best graduating student across all Master's degrees at Cranfield University.
VEGA Space Systems Engineering Prize, Cranfield University
Awarded to the best graduating student in Astronautics and Space Engineering.

2017 **International Space University Scholarship**, European Space Agency, UK Space Agency *€17,000*
Full scholarship to attend the ISU Space Studies Program 2017.

2015 **The Institution of Royal Engineers Medal**, Royal School of Military Engineering
Awarded to the best Officer on the Royal Engineers Commanders' Course.

2013 **The Queen's Medal**, Royal Military Academy Sandhurst, HM Queen Elizabeth II
Awarded to the first ranked Officer Cadet on the Commissioning Course.
The Ansen Memorial Prize, Royal Military Academy Sandhurst
Awarded to the Officer Cadet obtaining the highest scores in academic studies.

2012 **Operational Service Medal - Afghanistan**, UK
Awarded for Operational Service in Afghanistan.
Non-Article 5 NATO Medal, The North Atlantic Treaty Organization (NATO)
Awarded for Operational Service with the International Security Assistance Force (ISAF).

2009 **Academic Scholarship**, Jesus College, University of Cambridge *£1,000*
Awarded for excellent performance in academic studies.

2008 **Academic Exhibition**, Jesus College, University of Cambridge *£500*
Awarded for excellent performance in first-year academic studies.

2007 **UK Armed Forces Bursary**, UK Ministry of Defence *£9,000*
Scholarship to study at University whilst serving in the military.

Publications

Journal Articles

R. S. Whittle, N. Keller, E. A. Hall, H. S. Vellore, L. M. Stapleton, K. H. Findlay, B. J. Dunbar, and A. Diaz-Artiles, "Gravitational dose response curves for acute cardiovascular hemodynamics in a tilt paradigm," *J. Am. Heart Assoc. [In Press]*, 2022.

L. G. Petersen*, **R. S. Whittle***, J. H. Lee, J. Sieker, J. Carlson, C. Finke, C. M. Shelton, J. C. G. Petersen, and A. Diaz-Artiles, "Gravitational effects on intraocular pressure and ocular perfusion pressure," *J. Appl. Physiol.*, vol. 132, no. 1, pp. 24-35, 2022. doi: 10.1152/japplphysiol.00546.2021.
*Authors contributed equally.

R. S. Whittle, L. M. Stapleton, L. G. Petersen, and A. Diaz-Artiles, "Indirect measurement of absolute cardiac output during exercise in simulated altered gravity is highly dependent on the method," *J. Clin. Monit. Comput.*, pp. 1-12, 2021. doi: 10.1007/s10877-021-00769-y.

R. S. Whittle and A. Diaz-Artiles, "Modeling individual differences in cardiovascular response to gravitational stress using a sensitivity analysis," *J. Appl. Physiol.*, vol. 130, no. 6, pp. 1983-2001, 2021. doi: 10.1152/japplphysiol.00727.2020.

R. S. Whittle and A. Diaz-Artiles, "An ecological study of socioeconomic predictors in detection of COVID-19 cases across neighborhoods in New York City," *BMC Med.*, vol. 18, art. 271, 2020. doi: 10.1186/s12916-020-01731-6.

R. S. Whittle, "Distance travelled by military recruits during basic training is a significant risk factor for lower limb overuse injury," *BMJ Mil. Health*, [Published Online First: 02 June 2020], 2020. doi: 10.1136/bmjmilitary-2020-001445.

In Review

R. S. Whittle and A. Diaz-Artiles, "Gravitational effects on jugular and carotid hemodynamics in graded head up and head down tilt".

N. Keller, **R. S. Whittle**, N. McHenry, A. Johnson, C. Duncan, L. Ploutz-Snyder, G. de la Torre, M. Sheffield-Moore, G. Chamitoff, and A. Diaz-Artiles, "Virtual Reality 'exergames' improve motivation and restorative effects of spaceflight countermeasures".

In Prep

H. S. Vellore, L. B. Davis, A. Karri, N. Keller, **R. S. Whittle**†, and A. Diaz-Artiles, "Changes in the Cardiovascular System in Parabolic Flight: Literature Review".
†Mentored Undergraduates.

R. S. Whittle and A. Diaz-Artiles, "Modeling cardiovascular response to centrifugation: A sensitivity analysis".

R. S. Whittle, N. Keller, E. A. Hall, H. S. Vellore, L. M. Stapleton, K. H. Findlay, B. J. Dunbar, and A. Diaz-Artiles, "Hemodynamic dose response to graded lower body negative pressure".

Peer-Reviewed Conference Papers

N. Keller, N. McHenry, C. Duncan, A. Johnston, **R. S. Whittle**, E. Koock, S. Sekhar Bhattacharya, G. De La Torre, L. Ploutz-Snyder, M. Sheffield-Moore, G. Chamitoff, and A. Diaz-Artiles, "Augmenting Exercise Protocols with Interactive Virtual Reality Environments," *2021 IEEE Aerosp. Conf.*, pp. 1-13, 2021. doi: 10.1109/AERO50100.2021.9438234.

R. S. Whittle and A. Diaz-Artiles, "Metabolic Modeling in Altered Gravity," *2020 IEEE Aerosp. Conf.*, pp. 1-17, 2020. doi: 10.1109/AERO47225.2020.9172582.

P. Dutta, O. Balcells-Quintana, A. Viros Martin, **R. Whittle**, P. K. Josan, N. Beebe, B. J. Dunbar, R. K. W. Wong, A. Diaz-Artiles, and D. Selva, "Virtual assistant for anomaly treatment in long duration exploration missions," *AIAA Scitech 2020 Forum*, pp. 1-9, 2020. doi: 10.2514/6.2020-2255.

R. S. Whittle, P. D. Hodkinson, B. Posselt, and D. C. Cullen, "Lunar EVA Emergency Pressurization (LEEP) Shelter: Concept Design Using a Systems Engineering Approach," *48th Int. Conf. Environ. Syst. (ICES)*, pp. 1-20, 2018. url: `hdl.handle.net/2346/74048`.

Conference Papers

T. Amorim*, C. Baoxin*, F. Carbognani*, B. Chan*, T. Colin*, A. A. De Biasi*, E. Elhacham*, A. D. Farias*, S. Franklin*, M. Kaufmann*, N. Koren*, M. Lali*, E. S. Li*, B. Liu*, M. A. Sumesh*, T. D. J. Mould*, S. O'Neill*, L. Pfeiffer*, S. Ponnumuthu*, X. She*, D. Sola*, K. Staats*, M. Valencia Arroyo*, **R. S. Whittle***, L. Xing*, J. Yu*, T. Yuan*, X. Zhang*, J. Pellegrino, and

R. Gevargiz, ”The Future of Internet of Things and Their Applicability to Space and Energy,” presented at the 68th International Astronautical Congress, Adelaide, Australia, 2017.
*Authors listed alphabetically.

Oral Papers and Published Abstracts

R. S. Whittle, H. S. Vellore, E. A. Hall, F. Real Fraxedas, K. H. Findlay, L. M. Stapleton, B. J. Dunbar, and A. Diaz-Artiles, ”Cardiovascular, autonomic, and cephalad dose-response to graded lower body negative pressure,” *[Accepted]* Aerospace Medical Association (AsMA) Annual Scientific Meeting 2022, Reno, NV, USA, May 22-26, 2022.

R. S. Whittle, ”Quantifying and modeling the acute cardiovascular response to altered-gravity and spaceflight countermeasures,” *[Accepted]* 2022 Rising Stars in Aerospace Symposium, Boulder, CO, USA, May 12-13, 2022.

R. S. Whittle, N. Keller, E. A. Hall, H. S. Vellore, L. M. Stapleton, K. H. Findlay, B. J. Dunbar, and A. Diaz-Artiles, ”Hemodynamic and autonomic response of the cardiovascular system to tilt: gravitational dose-response curves,” NASA Human Research Program Investigators’ Workshop, Virtual, February 7-10, 2022.

R. S. Whittle, L. G. Petersen, J. H. Lee, J. Sieker, J. C. G. Petersen, and A. Diaz-Artiles, ”Modeling changes in intraocular pressure associated with the physiological response to changes in the gravitational vector,” *Aerosp. Med. Hum. Perform.*, vol. 92, no. 6, p. 512, 2021.

R. S. Whittle, N. Keller, L. M. Stapleton, E. A. Hall, B. J. Dunbar, and A. Diaz-Artiles, ”Acute gravitational dose-response curves in hemodynamic and ocular variables induced by tilt,” in *Proceedings of the 2021 International Society of Gravitational Physiology (ISGP) Meeting*, P. Bagher, S. Bloomfield, A. Diaz-Artiles, and M.-A. Custaud, Eds., Lausanne, Switzerland: Frontiers Event Abstracts, pp. 234-239, 2021. doi: 10.3389/978-2-88971-011-9

R. A. Anderton, B. Posselt, M. Komorowski, **R. S. Whittle**, K. Fong, and P. D. Hodkinson, ”Medical Challenges and Considerations for a Short Duration Lunar Exploration Mission,” *Aerosp. Med. Hum. Perform.*, vol. 89, no. 3, p. 192, 2018.

B. Posselt, R. A. Anderton, M. Komorowski, B. Healey, T. G. Smith, **R. S. Whittle**, K. Fong, and P. D. Hodkinson, ”Medical Challenges and Considerations for an Established Lunar Base,” *Aerosp. Med. Hum. Perform.*, vol. 89, no. 3, p. 192, 2018.

R. S. Whittle, P. D. Hodkinson, and D. C. Cullen, ”A Systems Based Approach to Design the Lunar EVA Emergency Pressurization (LEEP) Shelter,” *Aerosp. Med. Hum. Perform.*, vol. 89, no. 3, p. 288, 2018.

R. S. Whittle, ”Mars EVA Emergency Pressurisation (MEEP) Shelter,” presented at Mars in the Age of New Space Launchers Symposium, London, UK, 2018.

R. S. Whittle, P. D. Hodkinson, D. C. Cullen, and B. Posselt, ”Engineering and Medicine: Interdisciplinary Collaboration in Space,” presented at the 2017 UK Space Conference, Manchester, UK, 2017.

Posters

A. Diaz-Artiles, **R. S. Whittle**, F. Real Fraxedas, E. A. Hall, H. S. Vellore, and B. J. Dunbar, ”Gravitational dose-response curves during tilt, LBNP, and centrifugation,” poster session presented at the NASA Human Research Program Investigators’ Workshop, Virtual, February 7-10, 2022.

F. Real Fraxedas, **R. S. Whittle**, and A. Diaz-Artiles, ”Modeling gravitational dose-response curves during tilt, LBNP, and centrifugation,” poster session presented at the NASA Human Research Program Investigators’ Workshop, Virtual, February 7-10, 2022.

A. Diaz-Artiles, **R. S. Whittle**, L. Stapleton, N. Keller, and B. J. Dunbar, ”Predicting Acute CV and Ocular Changes due to Changes in the Gravitational Vector,” poster session presented at the NASA Human Research Program Investigators’ Workshop, Virtual, February 1-4, 2021.

R. S. Whittle and A. Diaz-Artiles, ”A multidisciplinary approach to characterizing the long duration impact of hypogravity exposure on the cardiovascular system,” poster session presented at the NASA Human Research Program Investigators’ Workshop, Galveston, TX, USA, January 27-30, 2020.

N. Keller, **R. S. Whittle**, N. McHenry, S. Bhattacharya, C. Duncan, E. Koock, L. Ploutz-Snyder, G. De la Torre, M. Sheffield-Moore, G. Chamitoff, and A. Diaz-Artiles, ”Augmenting exercise protocols with interactive virtual reality environments,” poster session presented at the NASA Human Research Program Investigators’ Workshop, Galveston, TX, USA, January 27-30, 2020.

P. K. Josan, P. Dutta, A. Viros-i-Martin, N. Beebe, O. Balcells Quintana, M. McCarthy, **R. S. Whittle**, B. J. Dunbar, D. Selva, R. K. W. Wong, and A. Diaz-Artiles, ”Front-end development and experimental design for a virtual assistant in long dura-

tion exploration missions," poster session presented at the NASA Human Research Program Investigators' Workshop, Galveston, TX, USA, January 27-30, 2020.

D. Selva, P. Dutta, A. Viros-i-Martin, O. Balcells Quintana, N. Beebe, K. York, M. McCarthy, P. K. Josan, **R. S. Whittle**, B. J. Dunbar, R. K. W. Wong, and A. Diaz-Artiles, "Virtual assistant for anomaly treatment during long duration exploration missions," poster session presented at the NASA Human Research Program Investigators' Workshop, Galveston, TX, USA, January 27-30, 2020.

J. Lee, **R. S. Whittle**, A. Diaz-Artiles, J. Sieker, J. C. G. Petersen, and L. G. Petersen, "Gravitational effects on ocular perfusion pressure," poster session presented at the NASA Human Research Program Investigators' Workshop, Galveston, TX, USA, January 27-30, 2020.

R. S. Whittle and A. Diaz-Artiles, "Understanding cardiovascular changes on long duration spaceflight," poster session presented at Paving the Road to Living in Space - Asgardia's First Space Science and Investment Congress, Darmstadt, Germany, October 14-16, 2019.

R. S. Whittle, D. A. Alonso, and A. Diaz-Artiles, "Individual differences in cardiovascular responses to orthostatic stress," poster session presented at the NASA Human Research Program Investigators' Workshop, Galveston, TX, USA, January 22-25, 2019.

Theses

R. S. Whittle, "Lunar EVA Emergency Pressurisation (LEEP) Sheter: Concept design using a systems engineering approach," M. Sc. thesis, Cranfield University, Cranfield, UK, 2017.

R. S. Whittle, "Deep Space Habitat: Construction and operations," M. Sc. thesis, Cranfield University, Cranfield, UK, 2017.

R. S. Whittle, "Computer Aided Design of mixed-signal CMOS VLSI circuit," M. Eng. thesis, University of Cambridge, Cambridge, UK, 2011.

Reports

T. Amorim*, C. Baoxin*, F. Carbognani*, B. Chan*, T. Colin*, A. A. De Biasi*, E. Elhacham*, A. D. Farias*, S. Franklin*, M. Kaufmann*, N. Koren*, M. Lali*, E. S. Li*, B. Liu*, M. A. Sumesh*, T. D. J. Mould*, S. O'Neill*, L. Pfeiffer*, S. Ponnumuthu*, X. She*, D. Sola*, K. Staats*, M. Valencia Arroyo*, **R. S. Whittle***, L. Xing*, J. Yu*, T. Yuan*, X. Zhang*, J. Pellegrino, and R. Gevargiz, "NetSpace: The Internet of Things and future applications for energy and space," International Space University, Illkirch-Graffenstaden, France, Tech. Report., 2017. url: `isulibrary.isunet.edu/index.php?lvl=notice_display&id=10150`.
*Authors listed alphabetically.

Professional Reports

Wg. Cdr. P. D. Hodkinson RAF, Sqn. Ldr. B. Posselt RAF, Surg. Lt. Cdr. S. Miles RN, **Capt. R. S. Whittle RE**, "RAF CAM Space Strategy," Royal Air Force Centre of Aviation Medicine, Royal Air Force, UK, Tech. Report., 2018.

Lt. R. S. Whittle PARA, Maj. P. Mort PARA, "Study into the mileage covered by PARA Company recruits during weeks 1-20 of the Combat Infantryman's Course (CIC) PARA," Infantry Training Centre (Catterick), British Army, UK, Tech. Report., 2014.

Lt. R. S. Whittle PARA, Lt. A. A. McMullan PARA, "Guidance for post-exercise recovery," Infantry Training Centre (Catterick), British Army, UK, Tech. Report., 2014.

Film

E. Alexandrova, *Wanderers*, performances by M. Ho, A. Kennedy, M. Lawson, M. Levesque, and **R. S. Whittle**, Paris, France: Aurora Films, 2020. url: `en.unifrance.org/movie/51058/wanderers`.

News Articles Online

Futurity, "A simulation-based approach can accurately predict the effects of altered gravity on an individual basis, research shows," 2021.
url: `www.futurity.org/altered-gravity-simulation-2614042-2/?utm_source=rss&utm_medium=rss&utm_campaign=altered-gravity-simulation-2614042-2`.

Focus.pl, "Nie każdy nadaje się na astronautę. Jak możesz to sprawdzić na Ziemi?" 2021. url: `https://www.focus.pl/artykul/nie-kazdy-nadaje-sie-na-astronaute-jak-mozesz-to-sprawdzic-na-ziemi`.

Science Daily, ”Analysis can predict individual differences in cardiovascular responses to altered gravity,” 2021. url: www.sciencedaily.com/releases/2021/08/210812135913.htm.

Texas A&M University Engineering News, ”Analysis can predict individual differences in cardiovascular responses to altered gravity,” 2021. url: engineering.tamu.edu/news/2021/08/AERO-analysis-can-predict-individual-differences-in-cardiovascular-responses-to-altered-gravity.html.

KBTX News, ”Texas A&M researchers identify COVID-19 spread predictors (video),” 2020. url: www.kbtx.com/video/2020/11/24/texas-am-researchers-identify-covid-spread-predictors/.

KXXV News 25 (abc), ”Texas A&M study links four socioeconomic factors to COVID-19 spread,” 2020. url: www.kxxv.com/brazos/texas-a-m-study-links-four-socioeconomic-factors-to-covid-19-spread.

The Eagle, ”Texas A&M researchers help highlight COVID-19 risk factors,” 2020. url: theeagle.com/news/local/texas-a-m-researchers-help-highlight-covid-19-risk-factors/article_ebb4bf90-270a-11eb-8651-1f1a7fe37e72.html.

AAAS EurekAlert, ”Four major predictors of COVID-19 emerge in Texas A&M study,” 2020. url: www.eurekalert.org/pub_releases/2020-11/tau-fmp110420.php.

Science Daily, ”Four major predictors of COVID-19 emerge in new study,” 2020. url: www.sciencedaily.com/releases/2020/11/201104114724.htm.

Medical Xpress, ”Four major predictors of COVID-19 emerge in study,” 2020. url: medicalxpress.com/news/2020-11-major-predictors-covid-emerge.html.

News Medical, ”Texas A&M study identifies four significant predictors of COVID-19 cases,” 2020. url: www.news-medical.net/news/20201104/Texas-AM-study-identifies-four-significant-predictors-of-COVID-19-cases.aspx.

ScienMag, ”Four Major Predictors Of COVID-19 Emerge In Texas A&M Study,” 2020. url: scienmag.com/four-major-predictors-of-covid-19-emerge-in-texas-am-study/.

Texas A&M Today, ”Texas A&M Study Points To Four Major Predictors Of COVID-19 Spread,” 2020. url: today.tamu.edu/2020/11/11/texas-am-study-points-to-four-major-predictors-of-covid-19-spread/.

Texas A&M University Engineering News, ”Four major predictors of COVID-19 emerge in Texas A&M Study,” 2020. url: engineering.tamu.edu/news/2020/10/four-major-predictors-of-covid-19-emerge-in-texas-am-study.html.

Cranfield University, ”Richard Whittle – Winner of the Vice Chancellor’s Prize 2018,” 2018. url: www.cranfield.ac.uk/testimonial-listing/satm-astronautics-and-space-eng-richard-whittle.

Cranfield University, ”A new frontier in space medicine engineering (video)”, 2018. url: https://youtu.be/BCQaYeGnKAU.

Teaching

Teaching Experience

Academic Teaching

Fall 2020	**AERO489/689: Human Performance in Space**, Teaching Assistant	*Texas A&M*

Professional Teaching

2017-2018	**Partnership Funding for Government Infrastructure Projects**, Instructor *(multiple courses)*	*Turner & Townsend*
2016	**Potential NCOs' Command, Leadership, and Management Course**, Instructing Officer	*British Army*
2014-2015	**Parachute Regiment Aptitude Course**, Instructing Officer *(multiple courses)*	*British Army*
2010	**Potential Officers' Pre-Commissioning Course**, Instructing Officer	*British Army*

Presentations

Invited Talks

Fall 2021. *Introduction to R and Linear Mixed-Effects Models*. 3-Lecture Series, Texas A&M University.

Fall 2021. *Artificial Gravity*. Guest Lecture, AERO414/614 Human Performance in Space, Texas A&M University.

Fall 2021. *SANS*. Guest Lecture, AERO414/614 Human Performance in Space, Texas A&M University.

Fall 2021. *CV Modeling Workshop*. Guest Lecture, AERO414/614 Human Performance in Space, Texas A&M University.

Fall 2020. *SANS*. Guest Lecture, AERO489/689 Human Performance in Space, Texas A&M University.

Fall 2020. *CV Modeling Workshop*. Guest Lecture, AERO489/689 Human Performance in Space, Texas A&M University.

Spring 2019. *Human Performance in Space*. Invited talk: Texas A&M University SEDS, College Station, TX, USA.

Spring 2018. *Exploration: The military, space, and beyond*. Invited keynote: The Perse School, Cambridge, UK.

Spring 2018. *2018 Student Voice*. Valedictorian speech: Cranfield University, Cranfield, UK.

Mentoring

Academic Mentoring

since 2021	**Fèlix Real Fraxedas**, Visiting Student, CFIS, Universitat Politècnica de Catalunya
since 2021	**Hrudayavani S. Vellore**, Undergraduate, Aerospace Engineering, Texas A&M University
since 2020	**Eric A. Hall**, Undergraduate, Biomedical Engineering, Texas A&M University
since 2019	**Lindsay M. Stapleton**, Undergraduate, Aerospace Engineering, Texas A&M University

Professional Mentoring

2011-2012	**Mohammed Jawad**, Adjutant, Afghan National Defense and Security Forces (ANDSF), Ministry of Interior Affairs, Afghanistan

Service

Professional Experience

Project Manager *UK*

Turner & Townsend Partners LLP *2017-2018*

- Consultant project manager on secondment to the UK Environment Agency delivering tools and training to advise stakeholders nationwide on economic assessment and industry-government partnership funding of flood risk management assets. Local subject matter expert responsible for funding of flood defense assets in the Hertfordshire and North London region. Responsibilities including:
  - External stakeholder engagement and business development.
  - Training design and delivery.
  - Computational modeling of economic flood risk.
  - Schedule and resource management.
  - Performance measurement and reporting.
  - Risk and opportunity management.
- **Key achievements:**
  - Developed tool for economic assessment of flood risk management which was rolled out across the entire UK Environment Agency.
  - Delivered multiple workshops nationwide teaching partnership funding for government infrastructure projects to civil servants, contractors, and local stakeholders.
  - Organized and compèred 300 person infrastructure conference.

Executive Officer – Second-in-Command, Specialist Team Royal Engineers (STRE) *UK, Gibraltar*

The Corps of Royal Engineers, British Army *2016-2018*

- Executive officer responsible for day to day running of specialist team of 30 professional engineers specialising in air infrastructure as part of a specialist unit providing engineering design, infrastructure consultancy, and program, contract, and facilities management to Ministry of Defence airfields worldwide. Responsibilities including:
  - Design and interface management.
  - Construction supervision of on-site teams.
  - Schedule, resource, and requirements management.
  - Risk and opportunity management.
  - Project quality management and quality assurance of client deliverables.
  - Business development of future training opportunities.
- **Key achievements:**
  - Delivered report on program of works necessary to upgrade RAF Gibraltar for next-generation airframes, including pavement classification number (PCN), Manual of Aerodrome Design & Safeguarding (MADS) compliance, aeronautical ground lighting (AGL), and dispersal sizing.

Senior Operations Manager – Operations Officer, UK Defence Intelligence *UK*

The Corps of Royal Engineers, British Army *2015-2016*

- Senior operations manager running operations room responsible for 20 teams of operational field deployable geospatial intelligence analysts situated worldwide or held on high readiness for contingency operations, providing deployable geospatial support to UK defence. Responsibilities including:
  - External stakeholder engagement and business development across UK defence.
  - Contract development and management for provision of geospatial support to global operations and training.
  - Scheduling, planning, resourcing, and supervising training and deployments for up to 100 analysts.
  - Supporting deployed personnel with supply chain management, and as single point of contact for advice/assistance.
  - Managing logistics, data, kit, equipment, HR administration, and training of personnel on tasks.
  - Risk and opportunity management, anticipating and resolving dynamic operational risks and issues.
- **Key achievements:**
  - Organized and delivered two international exercises to develop joint operational capability with international partners.
  - Developed future plans, policy, and doctrine, integrating an understanding of operational needs and requirements with existing strategy.

Training Development Manager – Training Development Officer, School of Infantry *UK*

The Parachute Regiment, British Army *2013-2015*

- Project manager designing, resourcing, and leading a complex study with multiple national stakeholder buy-ins, examining rates and causes of injury amongst military recruits on flagship 28-week Combat Infantryman's Course. Responsibilities including:
  - Design, verification, and validation of study.
  - Schedule and resource management.
  - Performance measurement and reporting.
  - Risk and opportunity management.
  - Stakeholder engagement and management with large number of internal and external stakeholders.
- **Key achievements:**
  - Induced a scientifically informed redesign of flagship 6-month program used to train 3000+ personnel per year reducing wastage by five percent with estimated savings of £5M per annum across training pipeline.
  - Project outcomes widened to inform transformation of training practices across entire Army Recruiting and Training Division.

Change Consultant – Force Development Officer, Operational Task Force *Afghanistan*

The Parachute Regiment, British Army *2011-2012*

- Led force development program as change consultant for a multinational organization of 500+ specialist personnel operating in a complex hostile environment, working at a high level in conjunction with multinational military, government, and NGO stakeholders. Responsibilities including:
  - Organizational design and development. Consulting with a team of international partners to redesign organisational structure in order to deliver operational effect.
  - Designing and implemented management systems and information management processes generating greater control and oversight over personnel, direct career streaming, accreditation and pay.
  - Stakeholder engagement and management at government level with multiple internal and external agencies.
  - Operational readiness and transition, whilst simultaneously creating a long-term program plan for future force development activities.
  - Cost control of a multimillion dollar force development budget.
- **Key achievements:**
  - Successfully overhauled organizational structure to align client desires with budgetary constraints and operational needs.
  - Produced documentation in multiple languages to promote cross-cultural integration. Implemented system workflow to ensure continuity of benefits management.
  - Performance recognised by a letter of commendation from government ministry.

Operations and Personnel Manager – Platoon Commander *UK*

The Parachute Regiment, British Army *2009-2011*

- Managed a team of 30+ soldiers as a junior level executive. Delivered training, mentored and commanded personnel across a wide geographic area. Responsibilities including:
  - Performance measurement and reporting on personnel under command.
  - Identifying and resourcing development opportunities for personnel.
  - Planning and delivering individual and collective training.
  - Stakeholder engagement and management to deliver training.
- **Key achievements:**
  - Successfully integrated troops returning from operations in Afghanistan.

Volunteering and Outreach

2022	**Texas Science & Engineering Fair**, Senior Judge
since 2021	**Aggie Honor System Office**, Honor Council Member
2019-2020	**Peer Advisors for Veteran Education**, Veteran Mentor
2018-2021	**Team Rubicon USA**, Disaster First Responder
2017-2018	**Arkwright Scholarships Trust**, High School STEM Mentor
2017-2018	**Career Ready UK**, High School Career Mentor
2016-2017	**Cranfield University**, Course Representative - MSc Astronautics and Space Engineering
2016-2017	**British Army**, Casualty Notification and Visiting Officer

Peer Review

BMJ Open
BMC Health Services Research
PLOS ONE
Journal of Public Health and Emergency
Public Health
Reproductive Sciences
IEEE Aerospace Conference
INCOSE International Symposium

Professional Memberships

Aerospace Medical Association - Student Member
British Interplanetary Society - Fellow (FBIS)
Chartered Management Institute - Chartered Manager (CMgr MCMI)
Institution of Engineering and Technology - Member (MIET)
Institution of Royal Engineers - Member (MInstRE)
International Council on Systems Engineering - Associate Systems Engineering Professional (ASEP MINCOSE)
Royal Aeronautical Society - Student Affiliate Member
Space Medicine Association - Member

Professional Development

Apr 2022	**Center for the Integration of Research, Teaching, and Learning (CIRTL)**, Academy for Future Faculty (AFF) Fellow Certification
Jan 2020	**FCC**, Technician Class Radio License
Aug 2017	**FEMA**, Incident Command System 100/200/700/800
Oct 2017	**Construction Skills Certification Scheme**, Professionally Qualified Person
May 2017	**Royal Air Force**, Military Applications of Space
Jan 2017	**Axelos Global Best Practice**, PRINCE2 Practitioner
Dec 2016	**AGI**, Systems Tool Kit Master Certification
Dec 2016	**Axelos Global Best Practice**, Managing Successful Programmes Practitioner
Sep 2016	**Association of Project Management**, Project Management Qualification (APMP)
Aug 2015	**British Army**, Demolition Safety Officer
Apr 2014	**British Army**, Team Medic

References

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