Richard S. Whittle

PhD Candidate · Department of Aerospace Engineering

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Education

Texas A&M University *College Station, TX*

Doctor of Philosophy in Aerospace Engineering *TBC 2023*

- **Dissertation:** Predicting acute cardiovascular and ocular changes due to changes in the gravitational vector and effects of countermeasures
- **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*

Professional Experience

since 2018 **Graduate Research Assistant**, Department of Aerospace Engineering, Texas A&M University
since 2015 **Engineering Officer**, The Corps of Royal Engineers, British Army
2017-2018 **Project Manager**, Turner & Townsend Partners LLP
2009-2015 **Airborne Infantry Officer**, The Parachute Regiment, British Army

Executive Experience

2016-2018 **Second-in-Command**, 510 (Air Infrastructure) Specialist Team Royal Engineers, British Army
2016 **Operations Officer**, 14 Geographic Squadron, 42 Engineer Regiment (Geographic), British Army
2011-2012 **Force Development Officer**, The Parachute Regiment *(Operational Deployment)*, British Army

Awards, Fellowships, & Grants

2021	**AERO Graduate Excellence Fellowship**, Texas A&M University	*$ 1,000*
	AERO Graduate Excellence Fellowship, Texas A&M University	*$ 20,000*
	AERO Graduate Excellence Fellowship, Texas A&M University	*$ 1,000*
2020	**AERO Graduate Excellence Fellowship**, Texas A&M University	*$ 1,000*
2019	**Travel Award**, Texas A&M University	*$ 1,000*
	Winner - Best Poster, Paving the Road to Living in Space Conference	
2018	**The Vice Chancellor's Prize 2018**, Cranfield University	
	VEGA Space Systems Engineering Prize, Cranfield University	
2017	**International Space University Scholarship**, European Space Agency, UK Space Agency	*€ 17,000*
2015	**The Institution of Royal Engineers Medal**, Royal School of Military Engineering	
2013	**The Queen's Medal**, Royal Military Academy Sandhurst, HM Queen Elizabeth II	
	The Ansen Memorial Prize, Royal Military Academy Sandhurst	
2012	**Operational Service Medal - Afghanistan**, UK	
	Non-Article 5 NATO Medal, The North Atlantic Treaty Organization (NATO)	
2009	**Academic Scholarship**, Jesus College, University of Cambridge	*£1,000*
2008	**Academic Exhibition**, Jesus College, University of Cambridge	*£500*
2007	**UK Armed Forces Bursary**, UK Ministry of Defence	*£9,000*

Research Experience

Texas A&M University - Bioastronautics and Human Performance Laboratory *College Station, TX*
Advisor: Prof. Ana Diaz Artiles *since 2018*
Research Assistant – Bioastronautics, Aerospace Physiology, Computational Physiology, Spaceflight Associated Neuro-ocular Syndrome (SANS), Statistical Epidemiology

International Space University *Cork, Ireland*
Advisors: Mr. Joseph Pellegrino, Mr. Robert Gevargiz, Prof. Ana Diaz Artiles *2017*
Researcher – Internet of Things (IoT), Bioastronautics

Cranfield University - School of Aerospace, Transport, and Manufacturing *Cranfield, UK*
Advisors: Prof. David Cullen, Dr. Peter Hodkinson *2016-2017*
Graduate Researcher – Space Systems Engineering, Bioastronautics

British Army *UK*
Advisors: Maj. Craig Seller RE, Maj. Paul Mort PARA, Dr. Ali Parchami, Prof. Lloyd Clark. *2012-2016*
Professional Development Research – Geographic Information Systems (GIS), Biomechanics, Defence and International Affairs, War Studies

University of Cambridge - Department of Engineering *Cambridge, UK*
Advisor: Dr. David Holburn *2010-2011*
Graduate Researcher – Very Large Scale Integration (VLSI), Mixed-signal CMOS Integrated Circuits Design

Publications

Journal Articles

Petersen*, LG, **Whittle*, RS**, Lee, JH, Sieker, J, Carlson, J, Finke, C, Shelton, CM, Petersen, JCG, Diaz-Artiles, A. 2021. Gravitational effects on ocular pressure and perfusion pressure. Journal of Applied Physiology *(In Press)*.
*Authors contributed equally.

Whittle, RS, Stapleton, LM, Petersen, LG, Diaz-Artiles, A. 2021. Indirect measurement of absolute cardiac output during exercise in simulated altered gravity is highly dependent on the method. Journal of Clinical Monitoring and Computing [Published Online First: 22 October 2021]. doi: 10.1007/s10877-021-00769-y.

Whittle, RS, Diaz-Artiles, A. 2021. Modeling individual differences in cardiovascular response to gravitational stress using a sensitivity analysis. Journal of Applied Physiology, 130(6): 1983-2001. doi: 10.1152/japplphysiol.00727.2020.

Whittle, RS, Diaz-Artiles, A. 2020. An ecological study of socioeconomic predictors in detection of COVID-19 cases across neighborhoods in New York City. BMC Medicine, 18: 271. doi: 10.1186/s12916-020-01731-6.

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

In Review

Whittle, RS, Keller, N, Hall, EA, Vellore, HS, Stapleton, LM, Findlay, KH, Dunbar, BJ, Diaz-Artiles, A. 2021. Gravitational dose response curves for acute cardiovascular hemodynamics in a tilt paradigm.

In Prep

Vellore, HS, Davis, LB, Karri, A, Keller, N, **Whittle†, RS**, Diaz-Artiles, A. 2021. Changes in the Cardiovascular System in Parabolic Flight: Literature Review.
†Mentored Undergraduates.

Whittle, RS, Vellore, HS, Findlay, KH, Keller, N, Hall, EA, Stapleton, LM, Dunbar, BJ, Diaz-Artiles, A. 2021. Gravitational effects on cervical hemodynamics in graded head up and head down tilt.

Whittle, RS, Diaz-Artiles, A. 2021. Modeling cardiovascular response to centrifugation: A sensitivity analysis.

Whittle, RS, Keller, N, Hall, EA, Vellore, HS, Stapleton, LM, Findlay, KH, Dunbar, BJ, Diaz-Artiles, A. 2021. Hemodynamic dose response to graded lower body negative pressure.

Peer-Reviewed Conference Papers

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

Whittle, RS, Diaz-Artiles, A. 2020. Metabolic Modeling in Altered Gravity. 2020 IEEE Aerospace Conference. doi: 10.1109/AERO47225.2020.9172582.

Dutta, P, Balcells-Quintana, O, Viros Martin, A, **Whittle, R**, Josan, PK, Beebe, N, Dunbar, BJ, Wong, RKW, Diaz-Artiles, A, Selva, D. 2020. Virtual assistant for anomaly treatment in long duration exploration missions. AIAA Scitech 2020 Forum. doi: 10.2514/6.2020-2255.

Whittle, RS, Hodkinson, PD, Posselt, B, Cullen, DC. 2018. Lunar EVA Emergency Pressurization (LEEP) Shelter: Concept Design Using a Systems Engineering Approach. 48th International Conference on Environmental Systems. url: `hdl.handle.net/2346/74048`.

Oral Papers and Published Abstracts

Whittle, RS, Petersen, LG, Lee, JH, Sieker, J, Petersen, JCG, Diaz-Artiles, A. 2021. Modeling changes in intraocular pressure associated with the physiological response to changes in the gravitational vector. Aerospace Medicine and Human Performance, 92(6): 512.

Whittle, RS, Keller, N, Stapleton, LM, Hall, EA, Dunbar, BJ, Diaz-Artiles, A. 2021. Acute gravitational dose-response curves in hemodynamic and ocular variables induced by tilt. Frontiers in Physiology.

Anderton, RA, Posselt, B, Komorowski, M, **Whittle, RS**, Fong, K, Hodkinson, PD. 2018. Medical Challenges and Considerations for a Short Duration Lunar Exploration Mission. Aerospace Medicine and Human Performance, 89(3): 192.

Posselt, B, Anderton, RA, Komorowski, M, Healey, B, Smith, TG, **Whittle, RS**, Fong, K, Hodkinson, PD. 2018. Medical Challenges and Considerations for an Established Lunar Base. Aerospace Medicine and Human Performance, 89(3): 192.

Whittle, RS, Hodkinson, PD, Cullen, DC. 2018. A Systems Based Approach to Design the Lunar EVA Emergency Pressurization (LEEP) Shelter. Aerospace Medicine and Human Performance, 89(3): 288.

Amorim*, T, Baoxin*, C, Carbognani*, F, Chan*, B, Colin*, T, De Biasi*, AA, Elhacham*, E, Farias*, AD, Franklin*, S, Kaufmann*, M, Koren*, N, Lali*, M, Li*, ES, Liu*, B, Sumesh*, MA, Mould*, TDJ, O'Neill*, S, Pfeiffer*, L, Ponnumuthu*, S, She*, X, Sola*, D, Staats*, K, Valencia Arroyo*, M, **Whittle*, RS**, Xing*, L, Yu*, J, Yuan*, T, Zhang*, X, Pellegrino, J, Gevargiz, R. 2017. The Future of Internet of Things and Their Applicability to Space and Energy. 68th International Astronautical Congress.
*Authors listed alphabetically.

Posters

Whittle, RS, Diaz-Artiles, A. 2020. 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.

Keller, N, **Whittle, RS**, McHenry, N, Bhattacharya, S, Duncan, C, Koock, E, Ploutz-Snyder, L, De la Torre, G, Sheffield-Moore, M, Chamitoff, G, Diaz-Artiles, A. 2020. 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.

Josan, PK, Dutta, P, Viros-i-Martin, A, Beebe, N, Balcells Quintana, O, McCarthy, M, **Whittle, RS**, Dunbar, BJ, Selva, D, Wong, RKW, Diaz-Artiles, A. 2020. Front-end development and experimental design for a virtual assistant in long duration exploration missions. Poster session presented at the NASA Human Research Program Investigators Workshop, Galveston, TX, USA, January 27-30, 2020.

Selva, D, Dutta, P, Viros-i-Martin, A, Balcells Quintana, O, Beebe, N, York, K, McCarthy, M, Josan, PK, **Whittle, RS**, Dunbar, BJ, Wong, RKW, Diaz-Artiles, A. 2020. 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.

Lee, J, **Whittle, RS**, Diaz-Artiles, A, Sieker, J, Petersen, JCG, Petersen, LG. 2020. Gravitational effects on ocular perfusion pressure. Poster session presented at the NASA Human Research Program Investigators Workshop, Galveston, TX, USA, January 27-30, 2020.

Whittle, RS, Diaz-Artiles, A. 2019. 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.

Whittle, RS, Alonso, DA, Diaz-Artiles, A. 2019. 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

Whittle, RS. 2017. Lunar EVA Emergency Pressurisation (LEEP) Sheter: Concept design using a systems engineering approach. MSc Thesis, School of Aerospace, Transport, and Manufacturing, Cranfield University, UK.

Whittle, RS. 2017. Deep Space Habitat: Construction and operations. MSc Thesis, School of Aerospace, Transport, and Manufacturing, Cranfield University, UK.

Whittle, RS. 2011. Computer Aided Design of mixed-signal CMOS VLSI circuit. MEng Thesis, Department of Engineering, University of Cambridge, UK.

Reports

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

Professional Reports

Wg Cdr PD Hodkinson RAF, Sqn Ldr B Posselt RAF, Surg Lt Cdr S Miles RN, **Capt RS Whittle RE**. 2018. RAF CAM Space Strategy. Royal Air Force Centre of Aviation Medicine, UK: Royal Air Force.

Lt RS Whittle PARA, Maj P Mort PARA. 2014. 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, UK: British Army.

Lt RS Whittle PARA, Lt AA McMullan PARA. 2014. Guidance for post-exercise recovery. Infantry Training Centre, Catterick, UK: British Army.

Film

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

News Articles Online

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

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

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

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

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

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

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

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

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

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

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

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

Texas A&M Today, 2020. Texas A&M Study Points To Four Major Predictors Of COVID-19 Spread. 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, 2020. Four major predictors of COVID-19 emerge in Texas A&M Study. url: engineering.tamu.edu/news/2020/10/four-major-predictors-of-covid-19-emerge-in-texas-am-study.html.

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

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

Presentations

Invited Talks

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.

Contributed Presentations

Whittle, RS. 2018. Mars EVA Emergency Pressurisation (MEEP) Shelter. Oral presentation: Mars in the Age of New Space Launchers Symposium, London, UK.

Whittle, RS, Hodkinson, PD, Cullen, DC, Posselt, B. 2017. Engineering and Medicine: Interdisciplinary Collaboration in Space. Oral presentation: UK Space Conference, Manchester, UK.

Teaching Experience

Academic Teaching

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

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*

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

Outreach & Professional Development

Service and Outreach

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

Professional Development

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

Peer Review

BMJ Open
BMC Health Services Research
PLOS ONE
Journal of Public Health and Emergency
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

References

Prof. Ana Diaz Artiles *adartiles@tamu.edu*
Assistant Professor, Texas A&M University *+1-979-845-1187*

Dr. Peter Hodkinson *peter.hodkinson@kcl.ac.uk*
Clinical Senior Lecturer and Head of Aerospace Medicine, Kings College London *+44 (0)7736 049987*

Prof. David Cullen *d.cullen@cranfield.ac.uk*
Professior of Astrobiology and Space Biotechnology, Cranfield University *+44 (0)1234 758340*