


SHELLEY DIEWALD


From rocket engines to human performance: An integrated approach approach


Currently searching for a position that will allow me to build upon my current technical and interpersonal skill set through continued education and applied research within the athletic community

EDUCATION

- 2020
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2019


Master of Science Candidate, Sport and Exercise
Auckland University of Technology (AUT)  Auckland, NZ
- 2018
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2016


Post-Graduate Diploma, Sports Biomechanics
Loughborough University  Loughborough, UK
 - Dissertation on the epidemiology of injuries sustained in Surf Life Saving New Zealand inflatable rescue boats
- 2015
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2010


Bachelor of Science, Mechanical Engineering
The Ohio State University  Columbus, Ohio
 - Minor in Business Administration

CERTIFICATIONS

- 2017

Certified Strength and Conditioning Specialist (CSCS)
National Strength and Conditioning Association (NSCA)  Boca Raton, Florida
- 2017

First Aid/CPR/AED
American Red Cross  Boca Raton, Florida
- 2013

Irish History and Literature
Arcadia University  Dublin, Ireland

RESEARCH EXPERIENCE

- 2020
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2018

Research Officer, Sports Technology
Sports Research Institute New Zealand (SPRINZ), AUT  Auckland, NZ
 - Support in methodological design, data collection and analysis, and academic writing of human performance research
 - Designing and implementing bespoke algorithms for in-house and external performance testing equipment in aid of post graduate led research



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CONTACT

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New Zealand

LANGUAGE SKILLS

Matlab

R

LabView

TECHNOLOGY

Forceplates

Inertial Measurement Sensors


Isokinetic Dynamometry

Motion Capture

EMG

2020
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2018


Internship Programme Lead, Strength & Conditioning, Sports Technology

Sports Research Institute New Zealand (SPRINZ), AUT  Auckland, NZ

- Managing over 10 international and domestic strength and conditioning and sports technology interns; including project assignments, supervision tasks, and well-being
- Overseeing internship project methodological design, collection, analysis and reporting to ensure successful outcomes in the form of peer-reviewed journal publications

2020

Domestic Research Lead, Wearable Resistance Research

Sports Research Institute New Zealand (SPRINZ), AUT  Auckland, NZ

- Overseeing all domestic wearable resistance research; including grant application writing, project design and implementation, student supervision, and internal and external collaborations

2019
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2018


Research Officer, Biomechanics

Sports Research Institute New Zealand (SPRINZ), AUT  Auckland, NZ

- Biomechanics project lead for Surf LifeSaving New Zealand IRB Injuries, collaborating with AUT Design team
- Designed and conducted a series of epidemiological and biomechanical studies to investigate injuries sustained in inflatable rescue boats; resulted in funding received for continual biomechanical and design support

2019

Coordinator, SPRINZ Strength and Conditioning Conference

Sports Research Institute New Zealand (SPRINZ), AUT  Auckland, NZ

- Responsible for organization and execution of annual SPRINZ Pre-Conference
- Initiated and managed SPRINZ first annual conference digital poster presentation session

2018

Conference Secretary

International Society of Biomechanics in Sport  Auckland, NZ

- Conference co-secretary and IT lead for 2018 ISBS Conference in Auckland, supporting over 400 international delegates

2016

Lab Assistant, Exercise Physiology

Loughborough University  Loughborough, UK

- Aided undergraduate sports science dissertation and research
- Assisted research team with data collection and analysis with utilizing lab



INDUSTRY EXPERIENCE

2020
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2019

Research Marketing Lead, Lila EXOGEN

Sportboleh Sdn Bhd  Auckland, NZ

- Developed content for social media to translate research findings to easily digestible information

2018
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2017

Rocket Systems Engineer

Aerojet Rocketdyne

📍 West Palm Beach, Florida

- Systems engineer on Exploration Upper Stage: Space Launch Systems Program; responsible for system level requirements, integration, and the development and maintenance of a technical requirements database
- Presented system/engine level design reviews to Board Members and stakeholders (NASA, Boeing)

2017

Strength & Conditioning Internship

My Speed Trainer

📍 Coral Springs, Florida

- Aided in the delivery and coaching of periodised strength and speed programme to athletes (baseball, track, football)
- Conducted biomechanical analysis of athletes and presented feedback for further development

2016

Aeronautical Controls and Systems Engineer

Pratt & Whitney, Belcan Engineering Group LLC

📍 Palm Beach Gardens, Florida

- Designed, delivered, and troubleshoot integrated hardware and software systems during E190-E2 flight test campaign
- Developed and implemented GUI's for validation and verification of maintenance and operations procedures

2014

Research and Product Development Engineering Intern

Schlumberger

📍 Rosharon, Texas

- Managed, scheduled, and performed testing on swellable reactive elastomers under hazardous conditions
- Collected, analyzed and communicated data utilizing LabVIEW, Microsoft Excel, and Visual Basic; leading to the commercialization of products

2014
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2012

Engineering Intern, CAD Designer

Worthington Cylinders, Worthington Industries

📍 Worthington, Ohio

- Project lead, responsible for design and organization of SolidWorks models, assemblies, and drawings for product lines
- Assisted engineering team in design, manufacturing, and commercialization of innovative Cryogenic vessel products

2012
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2011

Quality and Operations/Epidemiology Lab Assistant

Ohio State Wexner Medical Center

📍 Columbus, Ohio

- Designed and developed a computer filing system for all hospital physician quality records
- Supported Infection Control Practitioners and Data Managers with analysis and presentation of research utilizing Microsoft Access

2012

Engineering Intern

Bosch Rexroth, Hagglunds Drives

📍 Columbus, Ohio

- Worked with engineers and assembly teams in the development of a new product line of hydraulic motors
- Created mechanical assemblies from concept to final design, utilizing SolidWorks, Microsoft Excel, etc.



RELEVANT PROJECTS

2020

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2018

Japan Collaboration – Sprinting and Wearable Resistance

Kanoya Research Institute, Sports Research Institute New Zealand (SPRINZ), AUT

📍 Auckland, NZ

- Led the analysis of a vast, multi-variate biomechanical data set, investigating sprinters and the effects of wearable resistance, limb loading
- Acute 30 participant data set with 3 separate loading protocols, 5 inertial measurement sensors, 3D motion capture, laser, and 50 meters of in-ground force plate data.
- Supported all analysis over 3 PhD students to completion, all utilising the data set for the entirety of their research

2020

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2018

Wearable Resistance Sports Performance Research

Sport Boleh, Sports Research Institute New Zealand (SPRINZ), AUT

📍 Auckland, NZ

- A multitude of international research collaborations, all investigating the acute and longitudinal effects of wearable resistance on sporting performance
- Collaborations include universities, international sporting academies, elite sports team, youth to olympic athletes.
- Project outputs include over 10 post-graduate student completions, 30 peer-reviewed journal publications, and external funding in excess of \$500,000

2020

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2018

forceDirect, Commercialisation of Portable Strength Device

Texas Kiwi, Sports Research Institute New Zealand (SPRINZ), AUT

📍 Auckland, NZ

- Lead team member in the development of a portable strength measuring device. Project taken from concept to commercialisation, including responsibility for hardware and software prototyping, upkeep, technical support, patent application, as well as commercial hardware and APP development
- Successful funding for on-going development obtained from KiwiNet Seed funding, and external investors
- Project outcomes include over 5 publications, completion of over 4 post-graduate students, and the design, development, calibration, and support of 20 prototypes, as well as external development of 25 commercially viable products and associated software

2019
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2018

Surf Life Saving New Zealand Inflatable Rescue Boat Project

Surf Life Saving New Zealand, Sports Research Institute New Zealand (SPRINZ), AUT

📍 Auckland, NZ

- A series of studies investigating the influence of IRB modifications to lower limb kinematics and loading in-lab and on-water
- Research outputs included injury assessment report, with ACC and internal database injury data analysis, instrumented on-water data collection, prototype IRB design footstrap, and an acute in-lab biomechanical analysis
- Successful project outcomes resulted in additional funding in excess of \$50,000

2015

Effect of Footwear on Dorsiflexion During Barbell Back Squat

The Ohio State University

📍 Columbus, Ohio

- Designed and performed testing to analyze the kinematic changes in Matlab, Excel, and LabVIEW
- Designed and built a sensor to track joint angle measurements during movement, utilizing SolidWorks and 3D printing

2015

Columbus Zoo - Brown Bear Enclosure Design

Columbus Zoo, The Ohio State University

📍 Columbus, Ohio

- Project leader of design team including prototyping, documentation, and fundraising
- Liaised with the Columbus Zoo to design a large scale enrichment device for the Alaskan Brown Bear enclosure

2013

Bench Press Spotter Arduino Prototype

The Ohio State University

📍 Columbus, Ohio

- Designed and assembled interactive, fully automatic, user friendly, bench press spotter
- Employed force resistive sensors, stepper motor actuators, and Arduino Interface



SELECTED PUBLICATIONS

Publications

Paul Macadam, Sergi Nuell, John B. Cronin, **Shelley Diewald**, Rebecca Rowley, James Forster & Pol Fosch (2020) Load effects of thigh wearable resistance on angular and linear kinematics and kinetics during non-motorised treadmill sprint-running, *European Journal of Sport Science*, DOI: [10.1080/17461391.2020.1764629](https://doi.org/10.1080/17461391.2020.1764629)

Macadam, Paul & Cronin, John & Neville, Jono & **Diewald, Shelley**. (2019). Quantification of the validity and reliability of sprint performance metrics computed using inertial sensors: a systematic review. *Gait & Posture*. [10.1016/j.gaitpost.2019.07.123](https://doi.org/10.1016/j.gaitpost.2019.07.123).

Macadam, Paul & Turon, Sergi & Cronin, John & **Diewald, Shelley** & Neville, Jono. (2019). Thigh positioned wearable resistance improves 40 m sprint performance: a longitudinal single case design study.* *Journal of Australian Strength & Conditioning**, 27. 39-45. [Link](#)

Diewald S.N., Hume P.A., Wilson B.D., Wooler A., Merrett R., Fong D.T.P., Reay, S., Smith, V. Recreational and competitive surf lifesaving injuries associated with inflatable rescue boats derived from a systematic literature review: Technical report #1 to Surf Life Saving New Zealand (SLSNZ). SPRINZ, Auckland University of Technology, 17th June 2019. 26 pages. [Link](#)

Diewald S.N., Hume P.A., Wilson B.D., Wooler A., Merrett R., Fong D.T.P., Reay, S., Smith, V. Surf lifesaving injuries in New Zealand between 2009 to 2018 derived from the Surf Life Saving New Zealand Injury reporting database: Technical Report #2 to Surf Life Saving New Zealand (SLSNZ). SPRINZ, Auckland University of Technology, 16th June 2019. 20 pages. [Link](#)

Diewald S.N., Hume P.A., Wilson B.D., Wooler A., Merrett R., Fong D.T.P., Reay, S., Smith, V. Recreational and competitive surf lifesaving injuries associated with inflatable rescue boats derived from an online survey of members: Technical report #3 to Surf Life Saving New Zealand (SLSNZ). SPRINZ, Auckland University of Technology, 16th June 2019. 26 pages. [Link](#)

Diewald S.N., Hume P.A., Malpas K., Wilson B.D., Wooler A., Merrett R., Fong D.T.P., Reay, S., Smith, V. Surf Life Saving Injuries in New Zealand between 2013 to 2017 derived from Accident Compensation Corporation Claims: Technical Report #4 to Surf Life Saving New Zealand (SLSNZ). SPRINZ, Auckland University of Technology, 16th June 2019. 36 pages. [Link](#)

Diewald S.N., Hume P.A., Malpas K., Wilson B.D., Wooler A., Merrett R., Grobleny M., Keeley, L., Reay, S., Smith, V. Boat instrumentation feasibility study to assess biomechanics of competitive surf lifesavers during inflatable rescue boat activities: Technical Report #5 to Surf Life Saving New Zealand (SLSNZ). SPRINZ, Auckland University of Technology, 16th June 2019. 28 pages. [Link](#)

Diewald S.N., Hume P.A., Wilson B.D., Wooler A., Merrett R., Fong D.T.P., Reay, S., Grobleny, M., Smith, V., Malpas, K., Keely, L. An overview of the issues for recreational and competitive surf lifesaving injuries associated with inflatable rescue boats: Technical report #6 to Surf Life Saving New Zealand (SLSNZ). SPRINZ, Auckland University of Technology, 18th June 2019. 14 pages. [Link](#)