Steven C Hespeler, Ph.D.

Postdoctoral Fellow
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SUMMARY

I am respectfully seeking a position focused in the data science area. Currently I am in the second year of a Postdoctoral Fellowship with a focus on research topics pertaining to predictive analytics, Deep Learning, Big Data, data analysis/visualization, optimization, and statistics. While pursing my PhD at NMSU, I've had the opportunity to conduct research in the areas of optimization, nonlinear modeling using secondary big data sources, machine/statistical learning, and reliability engineering. Most recent topics include modeling and prediction of electrochemical energy storage application via a deep learning data driven method and material failure prediction. At NMSU I've been able to advance my technical and teaching skills in the areas of statistics, predictive modeling, programming, and technical writing by teaching classes and working on a variety of research projects. As a Postdoctoral fellow and instructor I've had the opportunity to teach both online/in-class graduate and undergraduate level engineering courses and prepare Accreditation Board for Engineering and Technology (ABET) summaries and assessments. I am highly motivated, organized, and seeking employment to add income and work remotely.

Research Interests: Non-Destructive testing, Time-Series data, Big Data, Recurrent Neural Networks, Energy Storage, Machine Learning, Nonlinear Programming, Operations Research, Automation in Manufacturing

EDUCATION

New Mexico State University, Las Cruces, NM

Ph.D., Industrial Engineering, Dec 2020
Dissertation Title: *Online State of Charge Prediction in Next Generation Hybrid Vehicle Batteries Using Deep Recurrent Neural Networks and Continuous Model Size Control*
GPA 3.7
Advisor: Donovan Fuqua, Ph.D
Minor: Applied Statistics
Key Courses: Applied Predictive Modeling, Nonlinear Programming, Statistical Inference II, Advanced Regression Analysis, Numerical Methods

M.S., Industrial Engineering, May 2012
Topic: *Statistical Analysis of Composite Based Poly (Lactic Acid) Combined with Bio-Pigments and Resulting Optical and Mechanical Performance*
GPA: 3.95
Advisor: Delia Julieta Valles-Rosales, Ph.D
Key Courses: Statistical Inference I, Discrete Event Simulation, Reliability, Advanced Engineering Economy, Linear Programming, Advanced Quality Control, Technical Writing

Roger Williams University, Bristol, RI

B.S., Engineering (Minor in Mathematics), May 2008
Key Courses: Calculus I, II, III, Differential Equations, Statistics, Heat Transfer Fluid Mechanics
Advisor: Linda Riley, Ph.D

PUBLICATIONS

Papers Accepted:

Hespeler, S., Nemati, H., and Niri, ED. "Nondestructive Thermal Imaging Object Detection of Chile Peppers for Robotic Harvesting", Artificial Intelligence in Agriculture, 5, 102-117.

Hespeler, S. and Fuqua, D. "Online State of Charge Prediction in Next Generation Vehicle Batteries Using Deep Recurrent Neural Networks and Continuous Model Size Control", Journal of Energy and Power Technology, 3(1), 1-1.

Hespeler, S. and Fuqua, D. "Online RNN Model for SOC Prediction in Next Generation Hybrid Car Batteries", In IIE Annual Conference. Proceedings (pp. 97-102). Institute of Industrial and Systems Engineers (IISE).

Papers Accepted Pending Minor Revisions:

Hespeler, S. and Niri, ED. "Deep Learning for In-situ Layer Quality Monitoring during Directed Energy Deposition (DED) Additive Manufacturing Process", Submitted to Journal of Intelligent Manufacturing.

Fuqua D. and **Hespeler, S**., "Commodity Demand Forecasting Using Modulated Rank Reduction for Humanitarian Logistics Planning", Submitted to Expert Systems with Applications.

Papers Submitted or In Preparation:

Sina Zamen, **Hespeler, S**., Niri, ED., and David Jauregui "Gradient boosting for bridge rating classification using combined national bridge inventory and Oversized/Overweight vehicles traffic datasets", Currently in Development.

TEACHING AND RESEARCH EXPERIENCE

Postdoctoral Scholar: Winter 2021- Present

Department of Civil Engineering

- Create novel mathematical and predictive models for Non-destructive evaluation

New Mexico State University
Supervisor: Ehsan Dehghan Niri, PhD

Graduate Assistant: Fall 2020- Winter 2020

Department of Civil Engineering

- Conducted independent and group research focused in advanced Deep Learning applied to civil engineering applications

New Mexico State University
Supervisor: Ehsan Dehghan Niri, PhD

Instructor:

IE 217L - Manufacturing Processes Lab	Spring 2018
IE 375/575 - Manufacturing Processes II/ Advanced	Fall 2017
IE 590-M70 - Selected Topics	Summer 2017

Teaching Assistant:

IE 567 - Discrete Event Simulation	Spring 2013
IE 478 - Facilities Planning	Spring 2012
IE 152 - Introduction to Industrial Engineering	Fall 2011

Lab Monitor Aug 2017 to May 2018

Department of Industrial Engineering 3D Printing Lab

- Conduct experiments that abide by the NMSU lab safety rules, ensure all employees are up to date on safety training and monitor the safety of peers
- Complete requested printing jobs, maintain equipment, grow and monitor the 3D printing club
- As the master key keeper, monitor digit key codes for all students and faculty associated with labs
- Most recently led a group of graduate engineering students with a project consisting of 3D printing and control of a prosthetic hand

New Mexico State University
Supervisor: Delia Julieta Valles-Rosales, PhD

Graduate Assistant Jan 2013 to Aug 2013

Physical Science Laboratory

- Prepare literature review and technical report based on military and commercial drone technology
- Assist team with drone testing and governmental certification for private drone companies

New Mexico State University
1050 Stewart St, Las Cruces, NM 88003
Supervisor: Dennis Zacklan

Research Assistant (20 hrs/ wk) Jan 2011 to Aug 2011

Department of Industrial Engineering

- Worked on a semester long project creating a DOE, manufacturing an innovative combination of wood fiber composite samples, tensile testing of samples, and ANOVA

New Mexico State University
Supervisors: Delia Julieta Valles-Rosales, Ph.D

Research and Student Awards:

USDA Wheels of Change Engineering Research Award, Las Cruces, NM	Fall 2017
Aggie I-Corps Feasibility of Business Idea Award, Arrowhead Center, Las Cruces, NM	Apr 2016
New Mexico State University Honors Graduate	May 2012
Alpha Pi Mu, Industrial Engineering Honor Society Award	Jan 2011
E.I.T. Certification	Jan 2009
IEE/WERC Environmental Design Contest 1st Place Award	Apr 2008

SOFTWARE EXPERIENCE

Programming/Statistical:

Python:

- Environments- Spyder, Jupyter, Conda
- Packages and Libraries- TensorFlow, NumPy, Pandas, SciKit Learn, Keras, matplotlib, Seaborn, Django, IPython

Matlab, R, Minitab, C/C++ Java, Maple

Typesetting and Other:

LaTeX, Microsoft office, Markdown, Cura (and a variety of slicing and CNC software), Unigraphics NX, SoildWorks, AutoCad

PRESENTATIONS

Hespeler, S.C., Juhasz M., Niri, E.D., and Riemann J. "*Deep Learning for Real-time Non-destructive Inter-layer Quality Control during Additive* Manufacturing Process " TMS Conference, Anaheim, CA — Mar 2022

Hespeler, S.C. "*Deep Learning for Inter-layer Classification During In-situ Quality of Additive Manufacturing* " IMAC-XL Conference, Orlando, FL — Feb 2022

Hespeler, S.C. "*Implementation of Machine Learning Techniques to Predict the Prominent Factors Effecting the Life Cycle of a Flow Battery* " 1st Colloquium of Engineering and Technology, Universidad Autonoma de Ciudad Juarez, Ciudad Juarez, MX — Dec 2016

Hespeler, S.C. "*An Intelligent Predictive Algorithm Utilized to Assess Influential Factors Effecting the Recharge Process of a Zinc Polyiodide Flow Battery* " 1st International Workshop on Quality and Productivity, Universidad Autonoma de Baja California, Ensendada, Baja California, MX — Oct 2016

Hespeler, S.C., J. Soltero, and D.J. Valles-Rosales "*Mechanical Failure Evaluation of Novel Wood Plastic Composite*" 83rd National Technical Association Conference, Washington, D.C. — Sep 2011

Poster Presentations:

Hespeler, S.C. "*Novel RNN Model for SOC Prediction in Next Generation Batteries and Continuous Model Size Control* " Poster Presentation, IISE, New Orleans, LA — Nov 2020

D. Alodan, H. **Hespeler, S.C.** "*A Study of An Innovative Sustainable Blend of Materials between Red Chile Pepper Stems and Polymers* " ISERC Conference, Orlando, FL — May 2012

D. Alodan, H. **Hespeler, S.C.**, J. Soltero, B. Garcia, D.J. Valles-Rosales "*Sustainable Commodity Wood Plastic Composite Materials* from Chile Fibers and Plastic " 2nd Annual Southwest Energy Science and Engineering Symposium, El Paso, TX — Mar 2012

Hespeler, S.C. "*Biodegradation Analysis of a New Blend of Poly (lactic acid) and a Zinc Coordination Biopolymer subjected to Environmental Stresses* " GRAS Conference, New Mexico State University, Las Cruces, NM — Mar 2011