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EDUCATION

Candidate for PhD Civil and Environmental Engineering, *University of Maine* 2004
Degree anticipated May 2009.

Thesis Topic: *A 3D Lattice Model for Predicting the Mechanical Properties of Wood*

M.S. Civil and Environmental Engineering, *University of Maine*, Orono, ME (1995-1998)

Thesis Topic: *Application of X-Ray Microtomography to the Three-Dimensional Study of Concrete Fracture Energy*

A.B. Mathematics and Physics, *Amherst College*, Amherst, MA (1989-1993)

HONORS AND AWARDS

NSF GK-12: Sensors! Fellow, *UMaine Department of Electrical Engineering* 2006-2007

Graduate research assistantship to provide science, engineering and technology outreach to area middle and high schools.

University Graduate Research Assistantship, awarded for the 2005-2006 academic year

Second Place Graduate Expo Poster Competition, *University of Maine*, 2004

College of Engineering Graduate Teaching Award, received November 5, 2004

UMaine Engineering Art Club, Founder and President, 2004 to present

<http://www.engineering.umaine.edu/art>,

University Graduate Research Assistantship, awarded for the 1997-1998 academic year

Marshall of Chi Epsilon, Member Phi Kappa Phi, *University of Maine*, 1997-1998

PROFESSIONAL REGISTRATION

Arizona No. 37926 (Structural); Maine No. 10211; Member, ASCE

ACADEMIC EXPERIENCE

Teaching Experience

Instructor, *UMaine Department of Civil and Environmental Engineering* and *UMaine Graduate Faculty* (2003-Present)

ASCE ExCEED 2003 Teaching Fellow, *Northern Arizona University*

Adjunct Faculty, *Northern Arizona University (NAU) Department of Civil Engineering* (2001-2002)

Instructor, *UMaine Department of Civil and Environmental Engineering* (1998)

Teaching Assistant, *UMaine Department of Civil and Environmental Engineering* (1995, 1996)

High Math School Teacher and Volunteer Trainer, *Peace Corps*, Niger, West Africa (1993-1995)

Teaching Assistant, *Amherst College Departments of Math and Physics* (1992-1993)

Engineering Courses Taught

Structural Analysis I & II (Determinate and Indeterminate Structures), *NAU*

Timber and Masonry Design, *NAU*

Design of Wood Structures (Four times), *UMaine*

Design of Steel Structures (Three times), *UMaine*

Civil Engineering Graphics, *UMaine* – developed course for department

Special Topics - experimental micromechanics, *UMaine*

Structural Research Scientist, UMaine Advanced Engineered Wood Composites (AEWC) Center (2007 to present)

Funding received:

PI Maine Technology Initiative Grant (\$12,500), *Composite panels for county work release center within the corrections industry* (2008)

Applied for funding for six-month grant to develop design and presentation package for use of composite wood panels in the corrections housing industry.

Co-PI Engineer Research and Development Center Phase III (\$2,500,000), *Modular components and structures for force protection* (2008-2009)

Participated in contract negotiations and proposal writing for multi-task grant examining: use of micro and nano cellulose particles in ultra high strength concrete, modeling of FRP composite ballistic panel behavior under blast loading, modeling of FRP-wood hybrid composite panels for use in blast resistant buildings, and modeling of blast resistant wood structure connections under high strain loading. As part of this project, I develop thesis plans and programs of study with graduate students to and set high-level goals and review budgeting with project manager to, as well as maintaining day-to-day progress in the various research areas. Co-PI and project manager (\$253,000), *Concret-filled tubular FRP arch bridges* (2008)

Co-wrote grant application to Maine Department of Transportation for research and design leading to construction of first concrete-filled carbon-glass FRP tube arch bridge being constructed on Route 11/100 in Pittsfield, ME. Lead engineer for design of structural system, including working with MDoT during construction. Co-advisor to graduate student working on related (but separately funded) project modeling behavior of concrete-filled FRP arches under bending and axial load.

Research and development projects managed:

Multi-task FHWA project developing wood-plastic composites (WPC) for infrastructure (2007 to present)

Coordination of regular reporting and primary responsibility for developing demonstration projects. Working with the Town of Greenville, ME on designing section of new Junction Wharf on Moosehead Lake. Research portion includes investigation of cold-temperature response of WPC to impact loading.

Hybrid-wood FRP composite pier for Jonesport, ME Coast Guard station (2005-2006)

Design of hybrid FRP and WPC coastal pier including structural design, cost estimation and coordination with architect and Coast Guard. Pier, piles, decking and bracing fabricated from a variety of composite hybrid materials to provide single-source long-term monitoring opportunities for multiple materials in a harsh environment.

Graduate research projects co-supervised and co-advised:

William Syron (MS anticipated 2010). *Nonlinear Behavior of Coated Structural Lumber Connections Under Dynamic Loading.*

Nicholas Parlin (MS anticipated 2010). *Behavior of Composite Wood Panels under Dynamic Loading Using Nonlinear MDOF Analysis.*

Ashley Tower (MS anticipated 2010). *Modeling of Modular Ballistic Protective Systems (MBPS) Ballistic Panels under Blast Pressure and Ballistic Performance.*

Sarah Peters (MS anticipated 2009). *Investigations of Micro and Nano Cellulose Fiber Reinforced Ultra High Performance Concrete for Fracture Toughness.*

Daniel Bannon (MS anticipated 2009). *Design and Characterization of Concrete-Filled FRP Arch Tubes for Structural Members.*

Anthony Dumais (MS 2008). *Optimized Wood Components and Subassemblies for Maximum Ductility.*

Daniel Thomas (MS 2008). *Connections in Fiber Reinforced Wood Building Structures for Blast Force Protection.*

Additional Research Projects:

Tri-axial testing of GFRP high-voltage insulator poles (2006-2007)

Co-developed methodology, instrumentation and apparatus requirements for testing high-strength insulator poles under combined axial and multi-axis bending loads. Prepared proposal for implementation of research plan.

Structural control of cellular solids (2003)

As a graduate research assistant, developed parametric structural models for hypothetical biomimetic material that would behave like the autodeformable *Mimosa pudica* pulvinus. Advised undergraduate REU student on project.

PROFESSIONAL EXPERIENCE

Consulting Structural Engineer, Private Practice. Orono, ME (2003-present)

Structural design for new construction and renovations, construction inspection and field investigations. Practice includes consulting to UMaine AEWCC Center on military and civilian research projects as well as non-University consulting.

Consulting Structural Engineer, Shephard-Wesnitzer, Inc. Flagstaff, AZ (1998-2002)

Structural design for new construction and renovations, construction inspections and field investigations. Designed concrete, masonry, timber and steel residential and commercial structures.

REFEREED ARTICLES

Davids, W.G., Nagy, E. and Richie, M.C. (2008). "Fatigue Behavior of Composite-Reinforced Glulam Bridge Girders." *Journal of Bridge Engineering*, ASCE 13(2): 183-191.

Fournier, C. R., W. G. Davids, E. Nagy, and E. N. Landis (2007). "Morphological Lattice Models for the Simulation of Softwood Failure and Fracture". *Holzforschung*, 61(4): 360-366.

Landis, E. N. , T. Zhang, E. N. Nagy, G. Nagy, and W. R. Franklin, "Cracking, Damage and Fracture in Four Dimensions," *Materials and Structures*, V. 40, No. 4, 2007, pp. 357-364.

Landis, E. N., E. N. Nagy and D. T. Keane (2003). "Microstructure and Fracture in Three Dimensions." *Engineering Fracture Mechanics* 70(7): 911-925.

Nagy, E. N., and Landis, E. N., (1998). "Energy-Microcrack Growth Measurements for Mortar Cylinders in Compression." *Nondestructive Characterization of Materials in Aging Systems*, J. D. A. R. L L. Crane, S. P. Shah, T. E. Matikas, P. T. Khuri-Yakub, R. S. Gilmore, Eds., Materials Research Society, Warrendale, PA, 201-206.

Landis, E. N., A. L. Petrell, S. Lu, and E. N. Nagy, (2000). "Examination of Pore Structure Using Three Dimensional Image Analysis of Microtomographic Data." *Concrete Science and Engineering*. V. 2, No. 8, 162-169.

Landis, E. N., and E. N. Nagy, (2000). "Three-dimensional work of fracture for mortar in compression." *Engineering Fracture Mechanics*. V. 65, No. 2-3. 223-234.

Landis, E.N., Nagy, E.N., Keane, D.T. and Nagy, G., (1999). "Technique to Measure 3-D Work-of-Fracture of Concrete in Compression." *Journal of Engineering Mechanics*, V. 125, N. 6, 599-605.

Landis, E. N., Nagy, E. N., and Keane, D. T., (1996). "Microtomographic Measurements of Internal Damage in Portland Cement-Based Composites." *Journal of Aerospace Engineering*, 10(1).

ARTICLES IN PREPARATION

Nagy, E., W. G. Davids and E. N. Landis (in preparation). "Using a Lattice Model to Predict Energy Release During Mechanical Loading of Wood." To be submitted to *Holzforschung* December, 2008

Nagy, E., E. N. Landis and W. G. Davids (in preparation). "Effect of fastener diameter on failure mode

and load for bolt tear out in wood: a comparison of data from experiments and a 2d non-linear morphological model.” To be submitted to ASCE Journal of Engineering Mechanics, 2009.

Dumais, A., H. Dagher, E. Nagy, E. Casidy and T. Cummins (awaiting security clearance). “Blast Behavior of Modular Buildings.” To be submitted to SAVIAC Shock and Vibration Journal.

Dumais, A., H. Dagher, E. Nagy and T. Cummins (awaiting security clearance). “Behavior of FRP Coated T-Panels in Bending.” To be submitted to SAVIAC Shock and Vibration Journal.

Dumais, A., H. Dagher, E. Nagy, E. Casidy, L. Parent and T. Cummins (awaiting security clearance). “Behavior of FRP Reinforced Sandwich in Bending.” To be submitted to SAVIAC Shock and Vibration Journal.

OTHER PUBLICATIONS AND PRESENTATIONS

Nagy, E., W. G. Davids and E. N. Landis (2008). A Variable Model to Predict a Variable Phenomenon: Fracture in Wood. *4th Int'l Conference on Advanced Engineered Wood & Hybrid Composites*, Bar Harbor, ME.

Nagy, E., W. G. Davids and E. N. Landis (2008). Microfracture and Damage in Wood: A Lattice Simulation and Acoustic Emission Measurement. *8th World Congress on Computational Mechanics/5th European Congress on Computational Methods in Applied Science and Engineering*, Venice, Italy.

Fournier, C. R., E. Nagy, W. G. Davids and E. N. Landis (2007). A Morphological Lattice Representation of Wood for Damage and Failure Prediction. presented at the meeting of the Wood Based Composites Center, 3 October 2007, University of Maine, Orono, ME.

Nagy, E., E. N. Landis, W. G. Davids (2007). Using a Lattice Model to Examine Fracture Energy in Red Spruce. (Poster) presented at Wood Based Composites Center Annual Meeting, 3 October 2007, University of Maine, Orono, ME.

Davids, W. G., C. R. Fournier, E. Nagy and E. N. Landis (2006). Lattice Models of Spruce: Simulations of Failure and Fracture and Correlation with Small-Scale Experiments. *7th World Congress on Computational Mechanics*, Los Angeles, CA.

Davids, W. G., M. Richie and E. Nagy (2005). *Fatigue behavior of FRP-reinforced Douglas-fir glued laminated bridge girders*. Research report for FHWA.

Nagy, E., M. L. Peterson, W. G. Davids and E. N. Landis (2004). Modeling the Pulvinus. Engineering Mechanics Conference, University of Delaware, ASCE.

Nagy, E., T. Zhang, W. R. Franklin, G. Nagy and E. Landis (2003). 3D Analysis of Tomographic Images. 16th ASCE Engineering Mechanics Conference, Seattle, WA, ASCE.

Nagy, G., T. Zhang, W. R. Franklin, E. Landis, E. Nagy and D. Keane (2001). “Volume and Surface Area Distribution of Cracks in Concrete.” *Proceedings of the Fourth International Workshop on Visual Form*, Capri, Italy, May 28-30.

Landis, E. N., A. L. Petrell, and E. Nagy (2000). “Examination of Pore Structure and Durability Issues Using Three Dimensional Image Analysis of Microtomographic Data.” *Proceedings of the 14th ASCE Engineering Mechanics Conference*, Austin, TX, (CD-ROM).

Nagy, E., and E. N. Landis (1996). "Analysis of Microtomographic Images to Measure Work of Fracture in Concrete." *Review of Progress in Quantitative Nondestructive Evaluation*, Brunswick, Maine.

Landis, E. N., E. Nagy, D. T. Keane, and N. Huynh (1996). "Observations of Internal Fracture in Mortar using X-ray Microtomography." *1996 ASCE Engineering Mechanics Specialty Conference*, Ft. Lauderdale, FL, 637-640.

Landis, E. N., E. Nagy, D. T. Keane and S. P. Shah (1996). "Observations of Internal Crack Growth in Mortar using X-Ray Microtomography." *Fourth Materials Engineering Conference*, Washington, D. C., 1330-1336.

Landis, E. N., E. Nagy, D. T. Keane and S. P. Shah (1996). "Observations of Internal Crack Growth in

Mortar using X-ray Microtomography." *2nd International Conference on Nondestructive Testing of Concrete in the Infrastructure*, Nashville, TN, 54-59.

PATENTS AND PATENT APPLICATIONS

Dagher, Goslin Cassidy, Parent, Nagy 20070180982 (granted 2008). "Composite panels for blast and ballistic protection".

Cassidy, Dagher, Goslin, Parent & Nagy 60/765109 (2006). "Tent ballistic and blast protection system".

Cassidy, Dagher, Goslin, Nagy & Parent 60/765546 (2006). "Portable housing structure with ballistic armor".

Dagher & Nagy 60/795,855 (2006). "Rapidly-deployable expandable and re-usable composite building structure".

Dagher, Cassidy, Parent, Dumais, O'Neil, Nagy & Nye 11/699,872 (2008). "Blast and ballistic protection system".

MS AND PHD GRADUATE ENGINEERING COURSEWORK (GPA 4.0/4.0)

Advanced Structural Analysis	Mechanics of Wood and Wood Composites
Theory of Elasticity	Numerical Methods
Composite Materials	Bridge Engineering
Structural Dynamics	Fracture Mechanics
Design of Wood Structures	Advanced Strengths of Materials
Retaining Earth Structures	Thermal Soil Mechanics

ADDITIONAL INTERESTS

Outdoor activities including hiking, paddling and skiing

Still-life and landscape photography

Twenty plus years in live theater as set and lighting designer and technician, director and community theater board member, and very occasional actor

Fencing, USFA rated in sabre, épée and foil