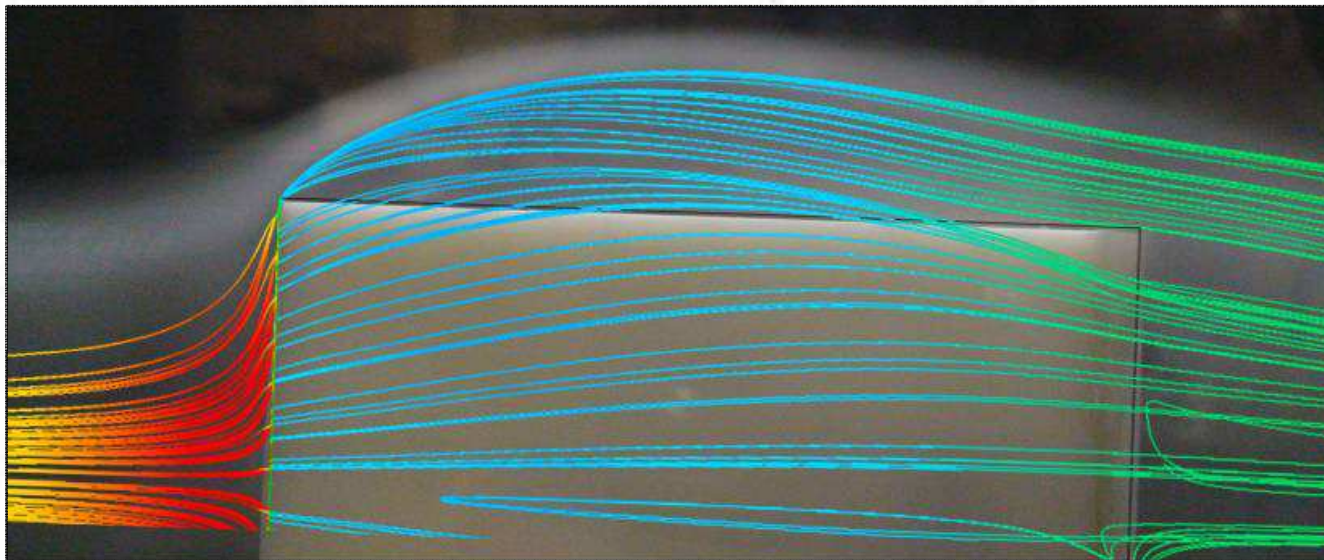# University of Nevada, Las Vegas (UNLV)
Howard R. Hughes College of Engineering

Overview of Security Engineering Research

Howard R. Hughes College of Engineering at UNLV

Dr. Rama Venkat
Dean, College of Engineering

Phone: (702) 895-1094
Email: Rama.Venkat@unlv.edu

Dr. Mohamed Trabia
Associate Dean, College of Engineering

Phone: (702) 895-0957
Email: Mohamed.Trabia@unlv.edu

Engineering various security systems are of the utmost importance to our State of Nevada as well as the nation. UNLV researchers have been addressing many challenges related to security engineering. This research has addressed questions related to many fields, including blast containment, shock mitigation, and smart grid security. Our researchers have been funded by various federal and state agencies as well as industrial partners.

We would like to introduce you to some of our researchers. Please feel to contact us if we can help with future collaboration.

Why UNLV?

- UNLV has a strong team of researchers who have collaborated on various areas of security engineering studies.

- UNLV researchers also have developed strong collaboration with key industrial partners including:

  - National Security Technologies, LLC (NSTec): NSTec manages operations at the Nevada National Security Site (NNSS) -- formerly known as the Nevada Test Site – and its related facilities and laboratories for the Department of Energy's National Nuclear Security Administration.

  - Varian Medical Systems: Varian's Security and Inspection Products group, based in Las Vegas, provides cargo screening systems with linear accelerators for X-ray imaging for cargo screening operations.

- UNLV is in the process of acquiring a linear accelerator, K9, which can be used for various applications, including cargo imaging for Homeland Security and U.S. Customs; we are also involved in radio-pharmaceutical production and medium-to-high dose rate research.

Security Engineering Research at UNLV

■ Our researchers have been involved in the development of many key security technologies.

■ Security Engineering research is a collaborative effort among faculty of the:

- Department of Electrical and Computer Engineering

- Department of Mechanical Engineering

- School of Computer Science

- Center for the Advanced Study of Algorithms (CASA)

- Center for Information and Communications and Technology (CICT)

- Center for Materials and Structures

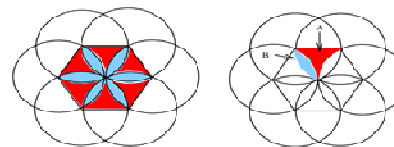- Energy Materials Interaction Technology Initiative of Nevada (EMITION) Center

Faculty involved in Security Engineering Research

- **Dr. Wolfgang Bein**

  Professor, School of Computer Science
  Director, Center for the Advanced Study of Algorithms (CASA)

- **Dr. William Culbreth**

  Associate Professor, Department of Mechanical Engineering

- **Dr. Yingtao Jiang**

  Associate Professor, Department of Electrical & Computer Engineering

- **Dr. Juyeon Jo**

  Associate Professor, School of Computer Science

- **Dr. Yoowan Kim**

  Associate Professor, School of Computer Science

- **Dr. Shahram Latifi, P.E.**

  Professor, Department of Electrical & Computer Engineering
  Director, Center for Information and Communications and Technology (CICT)

- **Dr. Brendan J. O'Toole**

  Associate Professor, Department of Mechanical Engineering
  Director, UNLV Center for Materials and Structures

- **Dr. Emma Regentova**

  Associate Professor, Department of Electrical & Computer Engineering

- **Dr. Stephen Rice, CPHIT, P.E.**

  Professor, Department of Mechanical Engineering

- **Dr. Aly Said, P.E.**

  Assistant Professor, Department of Civil and Environmental Engineering

- **Dr. Robert Schill**

  Professor , Department of Electrical & Computer Engineering
  Director , Energy Materials Interaction Technology Initiative of Nevada (EMITION) Center

- **Dr. Ying Tian**

  Assistant Professor, Department of Civil and Environmental Engineering

- **Dr. Mohamed Trabia**

  Professor, Department of Mechanical Engineering
 *Associate Dean for Research, Graduate Studies, and Computing*

Dr. Wolfgang Bein

Professor, School of Computer Science
Director, Center for the Advanced Study of Algorithms (CASA)

- Sensor networks
- Open Source Algorithm implementation
- Survey articles on issues in security
- Design of highly competitive online algorithms against different adversaries
- Smart use of randomization
- Approximations for hard combinatorial optimization problems

Email: wolfgang.bein@unlv.edu   Phone: (702) 895-1477
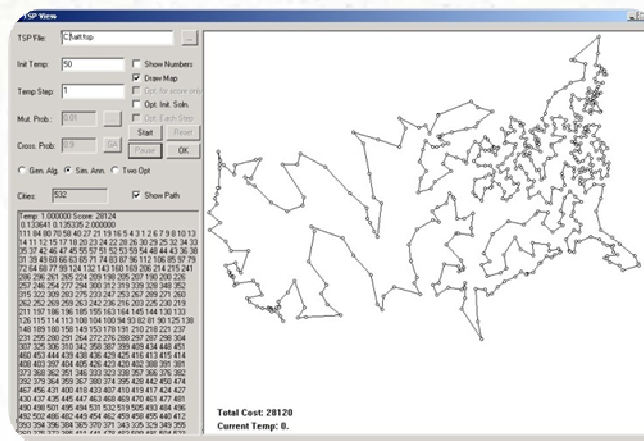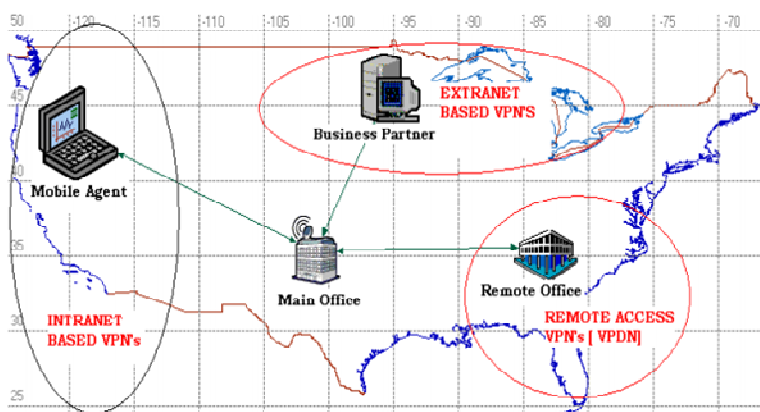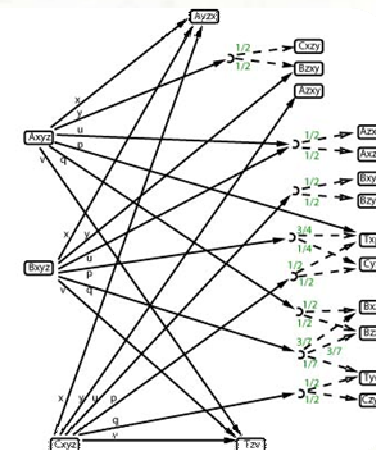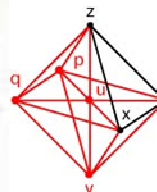
Dr. William Culbreth
Associate Professor, Department of Mechanical Engineering

Mr. Daniel Lowe

Mr. Robert O'Brien

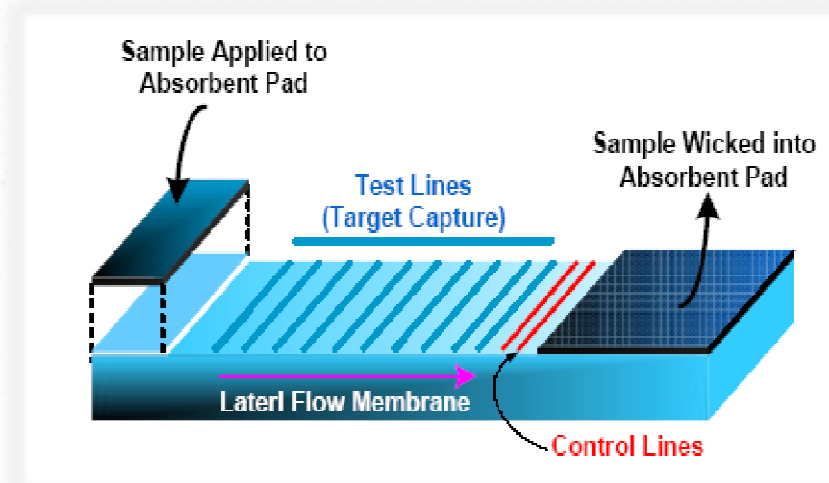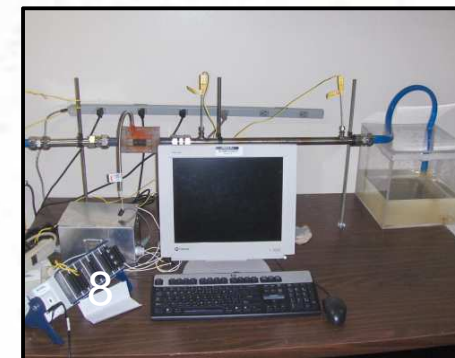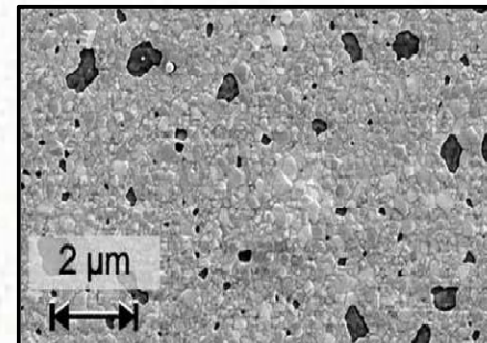*Research Engineers, Department of Mechanical Engineering*

- Computational modeling of radiation transport and nuclear criticality problems

- Experimental assessment of radiation detectors

- Active neutron interrogation and detection of Special Nuclear Material

- Dense Plasma Focus accelerator development for neutron production

- Design of alpha detectors for airflow measurements

- UAV flights and novel radiation detector development for UAVs

- Geologic nuclear reactor modeling

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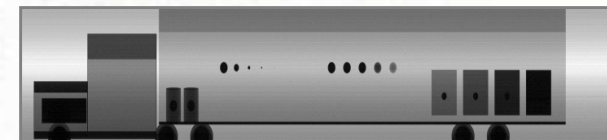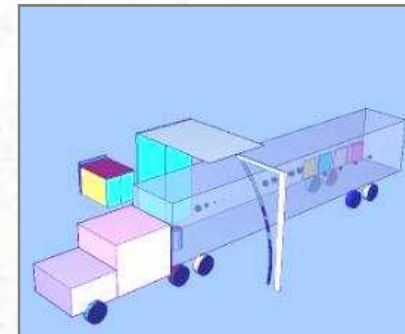
Dr. Yingtao Jiang

Associate Professor, Department of Electrical & Computer Engineering

- Sensor technologies and instrumentation for safety monitoring and process control of nuclear reactors

- Radiation shielding materials, including nano-material-enhanced shielding

- Development of detection algorithms and adaptive signal processing

- Uncertainty reduction for quantification of spent nuclear fuel

Sample Applied to Absorbent Pad

Test Lines (Target Capture)

Sample Wicked into Absorbent Pad

Laterl Flow Membrane

Control Lines

2 µm

Email: yingtao.jiang@unlv.edu   Phone: (702) 895-2533

Dr. Juyeon Jo
Associate Professor, School of Computer Science

- Secure and Reliable Communication Protocol for UAV (Unmanned Aerial Vehicle)
- Critical infrastructure/ smart grid security
- Man-In-The-Middle (MITM) Attack with a Tempered SSL Certificate Detection
- Thwarting DDoS (Distributed Denial-of-Service) Attack
- Digital Search Warrant
- Transportation Security Imaging and Secure Communication Software Development

Routing Table Population Process

Dr. Yoohwan Kim

Associate Professor, School of Computer Science

- Secure protocol development for software and network applications
- Critical infrastructure / smart grid security and privacy
- Wireless mesh network routing and security
- DdoS (Distributed Denial of Service) attack prevention
- Secure and reliable communication scheme for UAV (unmanned aerial vehicle)
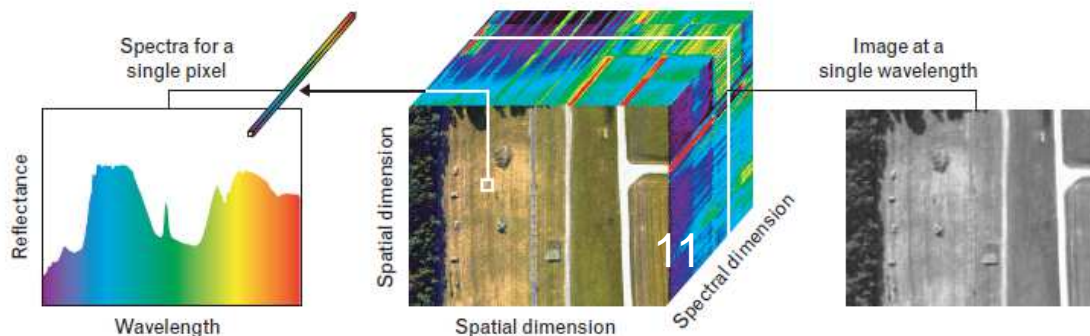- Airport security inspection software design and DICOS standard development
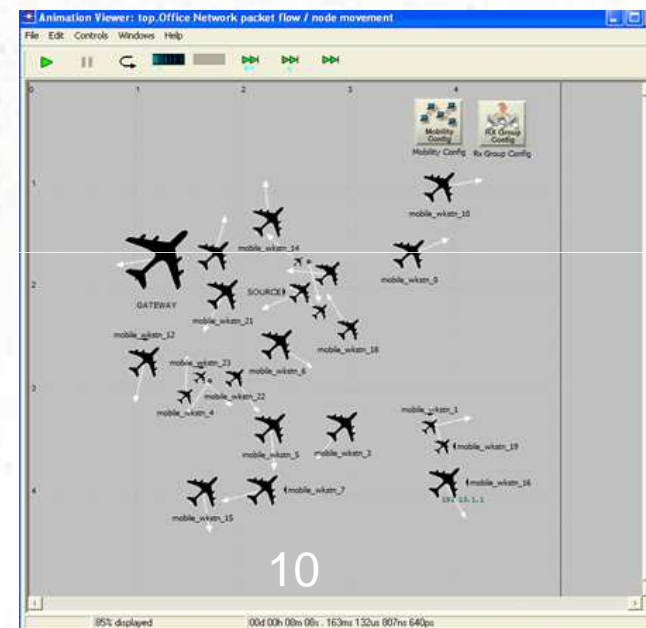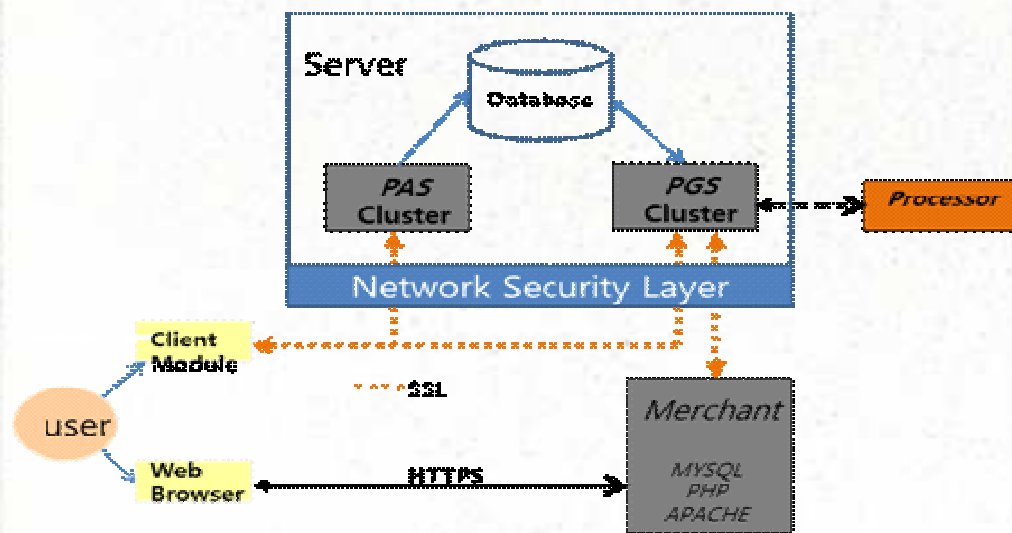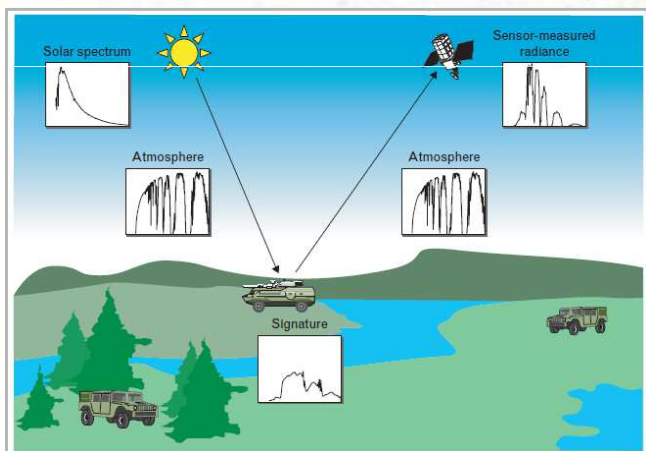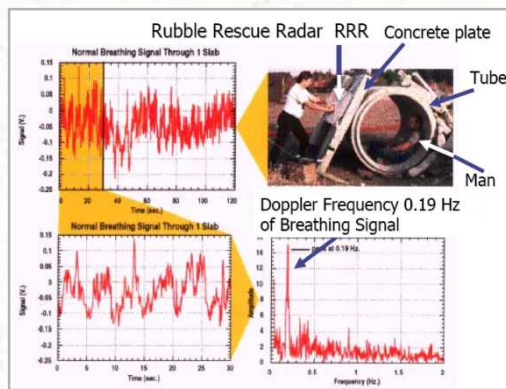
Dr. Shahram Latifi, P.E.

Professor, Department of Electrical & Computer Engineering
Director, Center for Information and Communications and Technology (CICT)

- Search and rescue
- Disaster relief
- Homeland Security
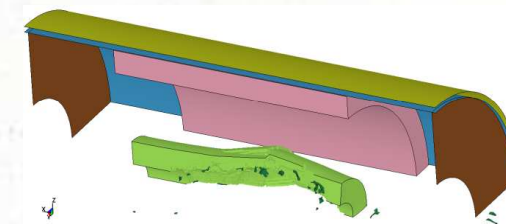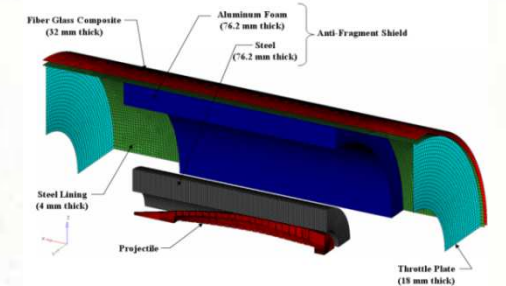- Nuclear non-proliferation
- Biometrics

Dr. Brendan O'Toole
Associate Professor, Department of Mechanical Engineering
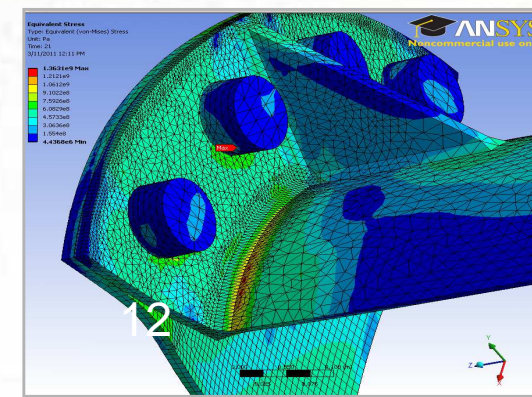*Director, UNLV Center for Materials and Structures*

Dr. Mohamed Trabia
Professor, Department of Mechanical Engineering
Associate Dean for Research, Graduate Studies, and Computing

- Structural analysis
- Failure analysis
- Experimental mechanics
- Structural dynamics
- Explosives and impact analysis
- Material characterization
- Computational simulation of highly dynamic events

(Schwer, 2009, Ref. 34)

Thin High Strength Steel for High Deformation

Lightweight Composite for Containment Strength

Internal Baffling to Distribute Blast Wave

Email: brendan.otoole@unlv.edu or mohamed.trabia@unlv.edu   Phone: (702) 895- 3885 / 5097
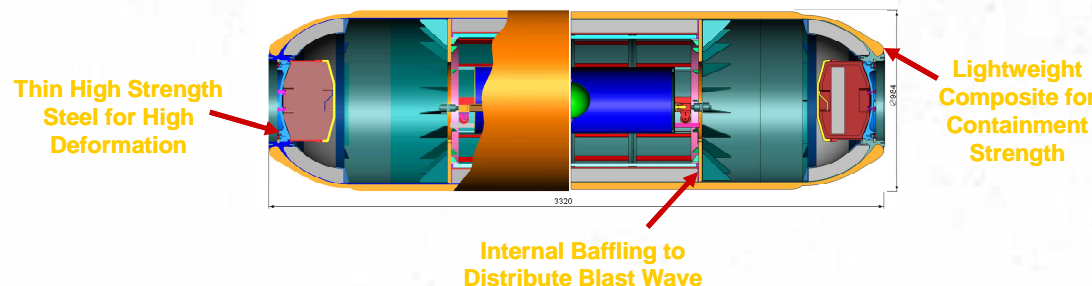
Dr. Emma Regentova
Associate Professor, Department of Electrical & Computer Engineering

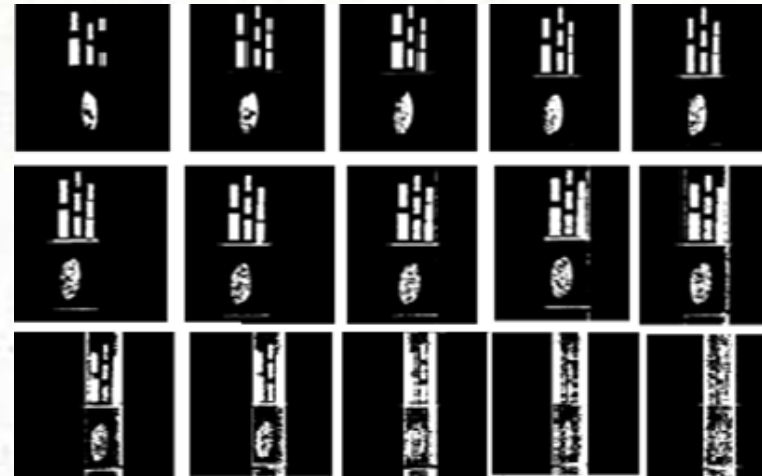- Pulsed ray radioscopy to detect nuclear materials

- Radioscopic cargo screening using megavoltage energy barriers

9MeV images of stricture with
14" of shield   15" of shield
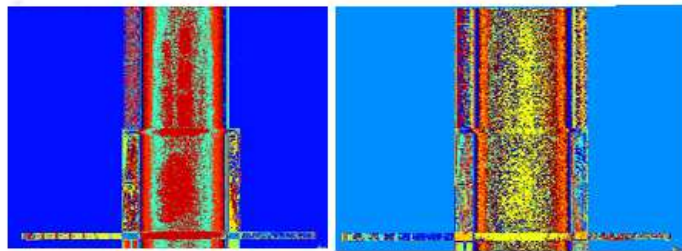
Detection od DU objects

Email: emma.regentova@unlv.edu   Phone: (702) 895-3187
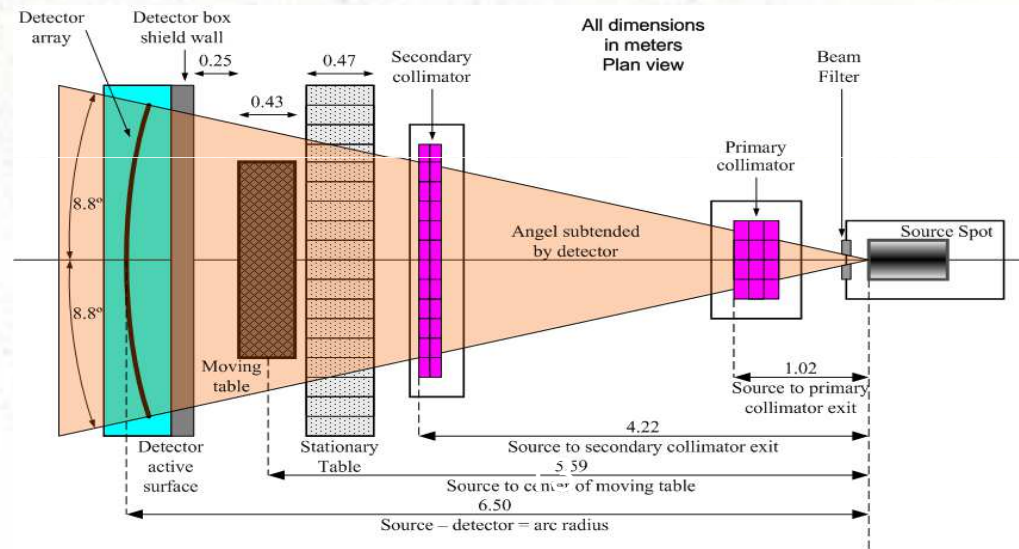
Dr. Stephen Rice, CPHIT, PE
Professor, Department of Mechanical Engineering

- Security and Privacy of Health Records
- Secure Electronic Records System (ERS)
- HIPAA Privacy and Security Rules
- Security policy and procedures to ensure legal compliance
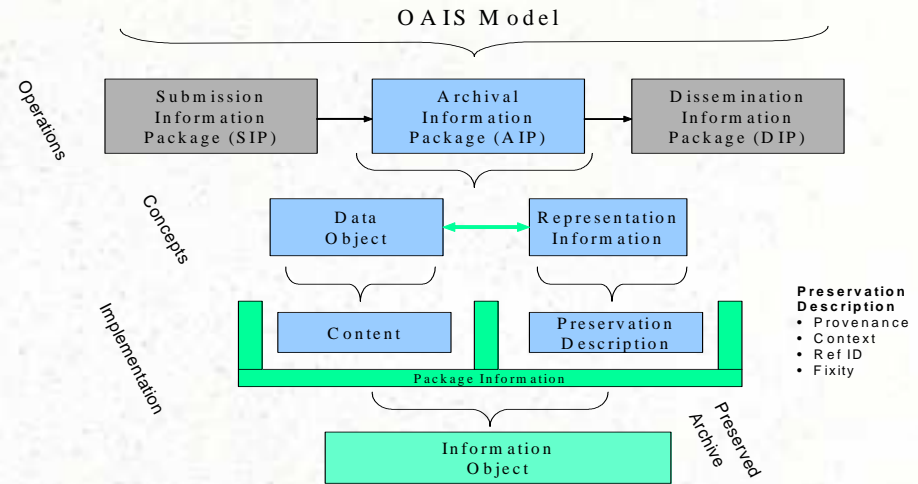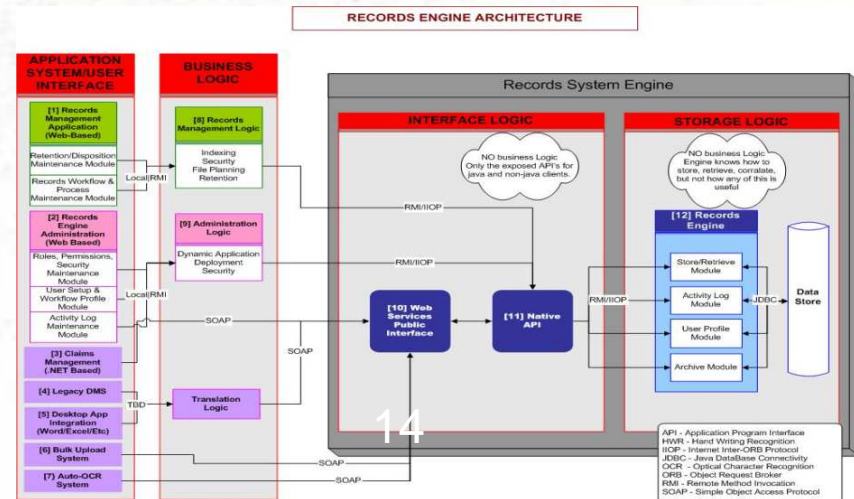
Dr. Aly Said, P.E.

Assistant Professor, Department of Civil and Environmental Engineering

Dr. Ying Tian

Assistant Professor, Department of Civil and Environmental Engineering

- Progressive collapse of reinforced concrete frame and flat-plate (beamless) structures
- Static and dynamic tests of large-scale reinforced concrete structural systems

Test Subassembly

Removed Column
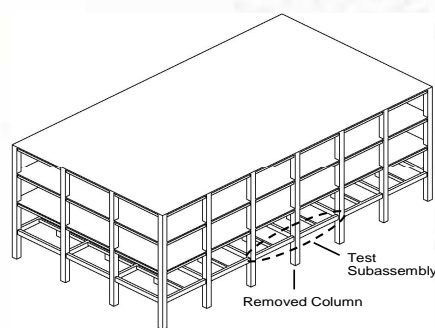
Static Loading Test

Dynamic Loading Test
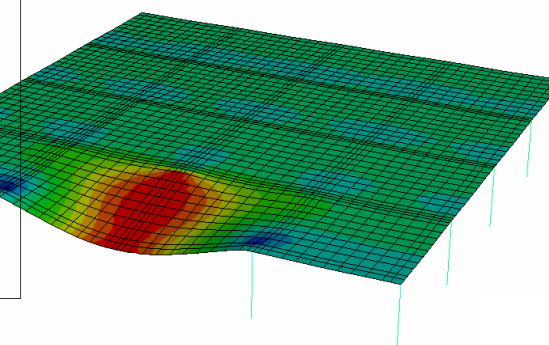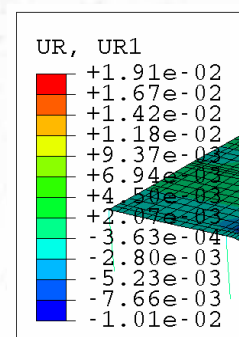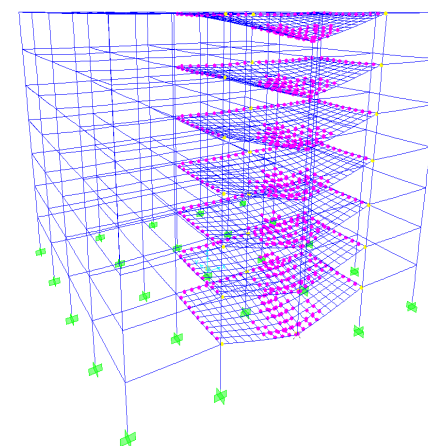
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| +6.94e-03 |
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| -2.80e-03 |
| -5.23e-03 |
| -7.66e-03 |
| -1.01e-02 |

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Dr. Robert Schill

Professor, Department of Electrical & Computer Engineering

Director, Energy Materials Interaction Technology Initiative of Nevada (EMITION) Center

- Pulsed power and plasma physics
- Microwaves and optics
- Materials science

Nevada Shocker

UNLV EM Dot

16

Email: robert.schill@unlv.edu   Phone: (702) 895-1526
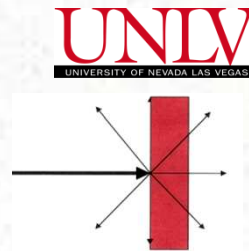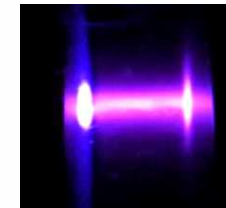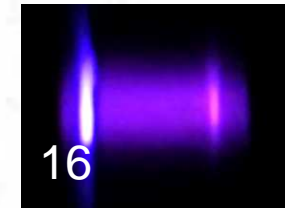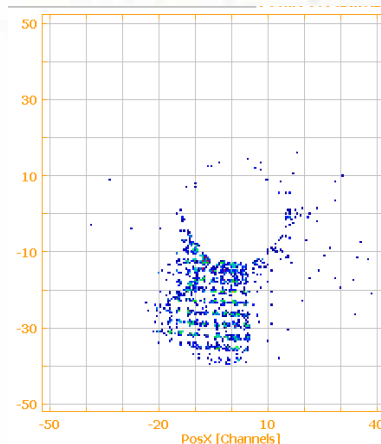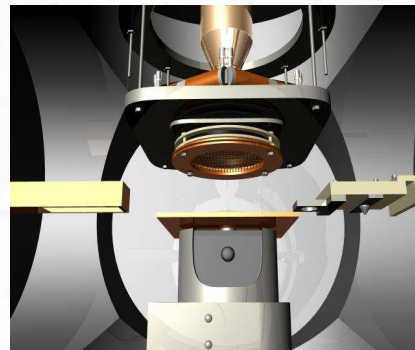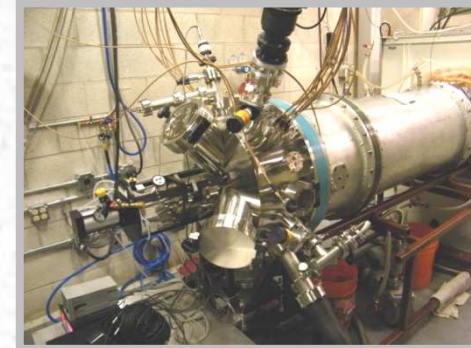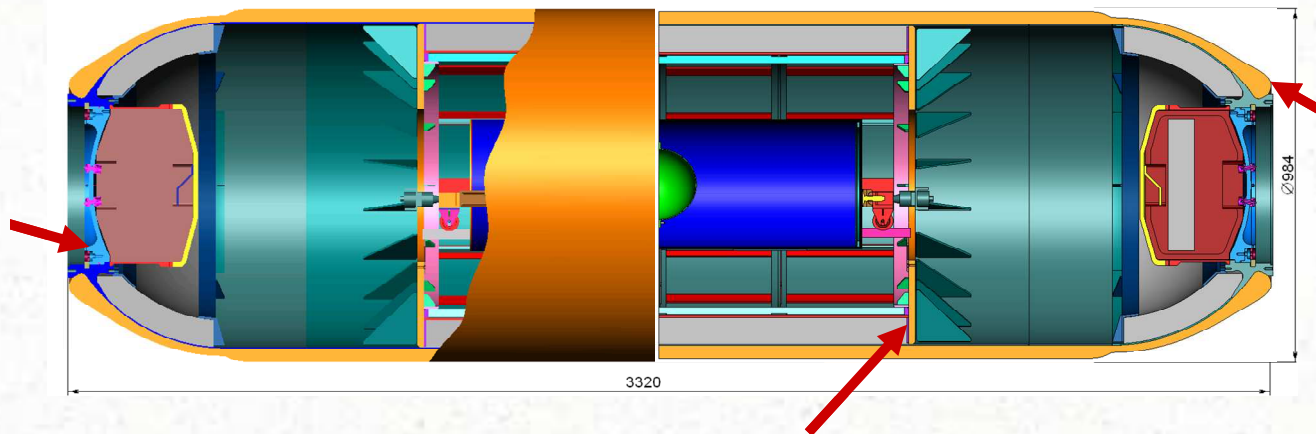
Security Engineering Research

CV and Publications
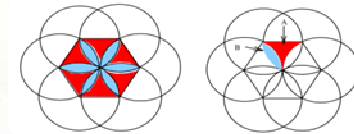
Dr. Wolfgang Bein

Professor, School of Computer Science
Director, Center for the Advanced Study of Algorithms (CASA)

Contact Information

College of Computer Science
Howard R. Hughes College of Engineering
University of Nevada, Las Vegas (UNLV)
Las Vegas, NV 89154-4019

Phone: (702) 895-1477
Email: wolfgang.bein@unlv.edu

Specialties

- Sensor networks
- Open Source Algorithm implementation
- Survey articles on issues in security
- Design of highly competitive online algorithms against different adversaries
- Smart use of randomization
- Approximations for hard combinatorial optimization problems
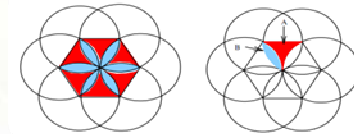
Dr. Wolfgang Bein

Recent Publications

- Bein W, Jeffery C. Towards an Openness Rating System for Open Source Software, In *Proceedings of the 43rd Annual International Conference on System Sciences* (CD-ROM), IEEE Computer Society Press, 2010.
- Bein D, Bein W, Madiraju P. The Impact of Cloud Computing on Web 2.0, Economy Informatics Journal. Vol. 9, No. 1/2009.
- Bein D, Bein W, Malladi S. Fault Tolerance Coverage Models for Sensor Networks. *International Journal of Sensor Networks*, 5(4): 199 – 209, 2009.
- Bein D, Bein W. Wireless Communication in Ubiquitous Environments, an Easy Target to Attacks. In *Proceedings of the 7th RoEduNet International Conference*, pages 17 – 20, UT Press, ISBN 978-973-662-393-6, 2008.
- Bein W. Copyright, an Incentive or a Burden. In *Proceedings of the 8th International Conference on Informatics in Economy (ICIE 2007)*, ASE Printing House, pages 139 – 144, 2007.
- Bein D, Bein W, Jolly V, Latifi S. Guarding against Web Spoofing and Phishing Attacks. In *Proceedings of the 5th RoEduNet IEEE International Conference*, Remus Brad (Ed.), L. Blaga University Press, Sibiu, (ISBN (10) 973-739-277-9), pages 106 – 109, 2006.
- Bein W, Bein D, Brajkovska N, Latifi S. An Optimal Embedding of Honeycomb Networks into Hypercubes. *Parallel Processing Letters*, 14(3-4): 367 – 375, 2004.
- Bein D, Bein W, Jolly V, Latifi S. Privacy and Security on Internet: Virtual Private Networks. In *Proceedings of the 3rd RoEduNet International Conference*, Timisoara, Romania, Transactions on Automatic Control and Computer Science, Vol. 49(63), pages 39 – 42, 2004.
- Bein W. Malicious Internet Use and Homeland Security. In *Proceedings of the 2nd RoEduNet International Conference*, Iasi, Romania, pages 23 – 26, 2003.

Dr. William Culbreth
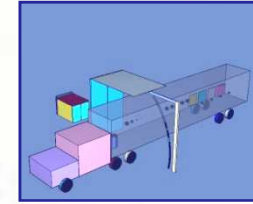
Associate Professor, Department of Mechanical Engineering

Contact Information

Howard R. Hughes College of Engineering
University of Nevada, Las Vegas (UNLV)
Las Vegas, NV 89154-4026

Phone: (702) 895-3699
Email: william.culbreth@unlv.edu

Specialties

- Computational modeling of radiation transport and nuclear criticality problems
- Experimental assessment of radiation detectors
- Active neutron interrogation and detection of Special Nuclear Material
- Dense Plasma Focus accelerator development for neutron production
- Design of alpha detectors for airflow measurements
- UAV flights and novel radiation detector development for UAVs
- Geologic nuclear reactor modeling

Dr. William Culbreth
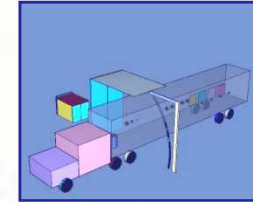
Recent Publications

- Viggato, J., and Culbreth, W., "Thermohydraulic and Nuclear Modeling of Natural Fission Reactors," ACS Symposium 945, Applied Modeling and Computations in Nuclear Science, pp. 131 – 141, 2006.

- Schill, R., Culbreth, W., and Venkat, R., "Insulator Surface Features Resulting from Cutting Techniques," 13th IEEE International Pulsed Power Conference Proceedings, Las Vegas, NV, 6/17-22, 2001.

- Culbreth, W. G., "Meeting the Needs of Industry: Development of a Microcontroller Course for Mechanical Engineers," ASEE Annual Conference Proceedings, Summer Annual Meeting, Albuquerque, NM, June 24-26, 2001.

- Culbreth, W., and Glew, T., "Assessment of Radionuclides in Enclosed Pipes and Vessels," Proceedings of RPS 2000, American Nuclear Society, Spokane, Washington, September 2000.

- Culbreth, W., and Viggato, J., "Determination of the Depth and Pressure within the Oklo Natural Reactors," Proceedings of RPS 2000, American Nuclear Society, Spokane, Washington, September 2000.

- Culbreth, W., "Radiation Shielding and Calculations for the TriMev X-Ray Source," Proceedings of RPS 2000, American Nuclear Society, Spokane, Washington, September 2000.

- Culbreth, W., and Steeps, L., "Nuclear Criticality at the Oklo Natural Reactors," Proceedings of the International Conference on Nuclear Engineering, San Diego, CA, May, 1998.

Dr. Yingtao Jiang

Associate Professor, Department of Electrical & Computer Engineering
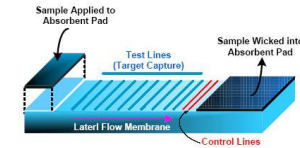
Contact Information

Howard R. Hughes College of Engineering

*University of Nevada, Las Vegas (UNLV)*

Las Vegas, NV 89154-4026

Phone: (702) 895-2533

Email: yingtao.jiang@unlv.edu

Specialties

- Sensor technologies and instrumentation for safety monitoring and process control of nuclear reactors
- Radiation shielding materials, including nano-material-enhanced shielding
- Development of detection algorithms and adaptive signal processing
- Uncertainty reduction for quantification of spent nuclear fuel

Dr. Yingtao Jiang

Recent Publications

- "S. Sun, C. Peng, W. Hou, J. Zheng, Yingtao Jiang, and X. Zheng, "Blind Source Separation with Time Series Variational Bayes Expectation Maximization Algorithm," accepted for publication in *Digital Signal Processing* in Oct. 2010.

- T. Moazzeni, J. Ma, Yingtao Jiang, and N. Li, "Flow Rate Measurement in a High Temperature, Radioactive, and Corrosive Environment," accepted for publication in *IEEE Transactions on* Instrumentation *and Measurement* on Jan. 27, 2010.

- Y. Ai, S.W. Joo, Yingtao Jiang, X. Xuan, and S. Qian, "Transient Electrophoretic Motion of a Charged Particle through a Converging-Diverging Microchannel: Effect of DC Dielectrophoretic Force," *Electrophoresis*, vol. 30, pp. 2499-2506, 2009.

- Y. Ai, S.W. Joo, Yingtao Jiang, X. Xuan, and S. Qian, "Pressure-driven Transport of Spherical Particles through a Converging-diverging Microchannel," *Biomicrofluidics*, vol. 3. no. 2, pp. 1-14, Apr. 2009.

- Y. Jin, L. Wang, J. Jo, Y. Kim, M. Yang and Yingtao Jiang, "EECCR: an Energy Efficient m-Coverage and n-Connectivity Routing Algorithm under Border Effects in Heterogeneous Sensor Networks," *IEEE Transactions on Vehicular Technology*, vol. 58, no. 3, pp. 1429-1442, March 2009.

- M. Yang, H. Selvaraj, E. Lu, J. Wang, S.Q. Zheng, and Yingtao Jiang, "Scheduling Architectures for DiffServ Networks with Input Queuing Switches," *Electronics and Telecommunications Quarterly*, vol. 55, no. 1, pp. 9-30, 2009.

- L. Wang, S. Piao, Yingtao Jiang, and L. Zhang, "On a Web-graph based Micro-network Architecture for SoCs," *Journal of Computer and Applications*, vol. 30, no. 1, pp. 1105-1111, March 2008.

- Y. Wang, Y. Tang, Yingtao Jiang, Y.-G. Chung, S.-S. Song, and M.-S. Lim, "Novel Memory Reference Reduction Methods for FFT Implementations on DSP Processors," *IEEE Transactions on Signal Processing*, vol. 35, no. 5, pp. 2338 – 2349, May 2007.

- L. Zhang, U. Kleine, and Yingtao Jiang, "An Automated Design Tool for Analog Layouts," *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, vol. 14, no. 8, pp. 881-894, Aug. 2006.

- Y. Kim, J. Jo, F. Merat, M. Yang, and Yingtao Jiang, "Mitigating Distributed Denial-of-Service Attack with Deterministic Bit Marking," *International Journal of Information Technology*, vol. 11. no. 2, pp. 62-82, 2005.
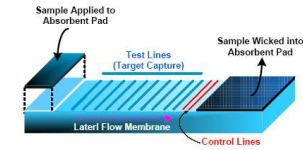
Dr. Juyeon Jo

Associate Professor, School of Computer Science
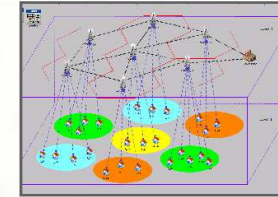
Contact Information

Howard R. Hughes College of Engineering

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Las Vegas, NV 89154-4026

Phone: (702) 895-5873

Email: juyeon.jo@unlv.edu

Specialties

- Secure and Reliable Communication Protocol for UAV (Unmanned Aerial Vehicle)
- Critical infrastructure/ smart grid security
- Man-In-The-Middle (MITM) Attack with a Tempered SSL Certificate Detection
- Thwarting DDoS (Distributed Denial-of-Service) Attack
- Digital Search Warrant
- Transportation Security Imaging and Secure Communication Software

Dr. Juyeon Jo
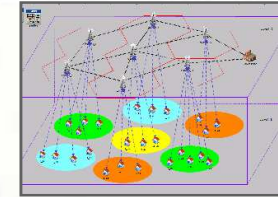
Recent Publications

- Kevin Benton, Ju-Yeon Jo, and Yoohwan Kim, "SignatureCheck: A Protocol to Detect Man-In-The-Middle Attack in SSL", 7th Annual Cyber Security and Information Intelligence Research Workshop, Oak Ridge, TN, Oct. 2011

- Yan Jin, Ling Wang, Ju-Yeon Jo, Yoohwan Kim, Mei Yang and Yingtao Jiang, "EECCR: An Energy-Efficient m-Coverage and n-Connectivity Routing Algorithm under Border Effects in Heterogeneous Sensor Networks", IEEE Transactions on Vehicular Technology, Vol. 58, Issue 3, March 2009, pp. 1429 – 1442.

- Yoohwan Kim, Ju-Yeon Jo, and Kyounghee Suh, "Baseline Profile Stability for Network Anomaly Detection", International Journal of Network Security, Vol. 6, No.1, pp. 60 – 66, Jan. 2008

- Hal Berghel, James Carpinter, and Ju-Yeon Jo, "Phish Phactors: Offensive and Defensive Strategies", Advances in Computers, publisher: Elsevier Science and Technology, Vol. 70, June 2007, pp. 223 – 268. (Book Chapter)

- Yoohwan Kim, Wei Ren, Ju-Yeon Jo, Mei Yang, Yingtao Jiang, Jun Zheng, "SFRIC: A Secure Fast Roaming Scheme in Wireless LAN Using ID-Based Cryptography", IEEE International Conference on Communications (ICC), June 2007, pp 1570 – 1575.

- Wei Ren, Yoohwan Kim, Ju-Yeon Jo, Mei Yang and Yingtao Jiang, "IdSRF: ID-based Secure Routing Framework for Wireless Ad-Hoc Networks", IEEE International Conference on Information Technology: New Generation (ITNG), April 2007, pp 102 – 110.

- Yoohwan Kim, Ahmed Abdelal, Ju-Yeon Jo, Yingtao Jiang, and Mei Yang, "An Efficient Defense against Distributed Denial-of-Service Attacks using Congestion Path Marking", IEEE ICC 2006, Istanbul, Turkey, June 2006 Vol. 5, pp 2159 – 2164.

Dr. Yoohwan Kim

Associate Professor, School of Computer Science

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Specialties

- Secure protocol development for software and network applications
- Critical infrastructure / smart grid security and privacy
- Wireless mesh network routing and security
- Distributed Denial of Service (DDoS) attack prevention
- Secure and reliable communication scheme for Unmanned Aerial Vehicles (UAVs)
- Airport security inspection software design and DICOS standard development

Dr. Yoohwan Kim

Recent Publications

- "D.Jungeun Kim and Yoohwan Kim, "A Secure on-line credit card transaction method: NNCC", Journal of Computing Science and Engineering, by KIISE, to appear in March 2011

- Yoohwan Kim, Wei Ren, Ju-Yeon Jo, Mei Yang, Yingtao Jiang, Jun Zheng," *SFRIC: A Secure Fast Roaming Scheme in Wireless LAN Using ID-Based Cryptography*", IEEE International Conference on Communications (ICC), June 2007

- Yoohwan Kim, Ju-Yeon Jo, and Kyunghee Kim Suh, "*Baseline Profile Stability for Network Anomaly Detection*", International Journal of Network Security (IJNS), vol. 6, no. 1, 2008, pp. 60-66, Jan. 2008

- Wei Ren, Yoohwan Kim, Ju-Yeon Jo, Mei Yang and Yingtao Jiang, "*IdSRF: ID-based Secure Routing Framework for Wireless Ad-Hoc Networks*", ITNG 2007, April 2007

- Yoohwan Kim, Wing Cheong Lau, Mooi Choo Chuah and H. Jonathan Chao, "*PacketScore: A Statistical Overload Control against Distributed Denial-of-Service Attacks*", IEEE Transaction on Dependable and Secure Computing, vol. 3, issue 2, pp. 141-155, Apr-Jun, 2006

- Yoohwan Kim, Ahmed Abd El Al, Ju-Yeon Jo, Mei Yang and Yingtao Jiang," *An Efficient Defense against Distributed Denial-of-Service Attacks using Congestion Path Marking*", IEEE ICC, June 2006
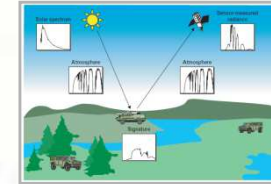
Dr. Shahram Latifi, P.E.

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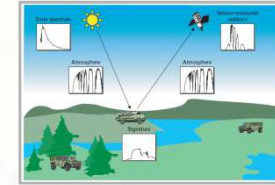
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Specialties

- Search and rescue
- Disaster relief
- Homeland Security
- Nuclear non-proliferation
- Biometrics

Dr. Shahram Latifi, P.E.

Recent Publications

- "D. Walker, S. Latifi,   "Partial Iris Recognition as a Viable Biometric Scheme", International Journal of Security Networks, to appear.

- M. Sadowitz, S. Latifi, D. Walker, "An Iris and Retina Multimodal Biometric System" International Journal of Security and Networks (IJSN), Vol. 3, no. 4, 2008, pp. 250-257.

- V. Jolly and S. Latifi, "Reliable Data Transmission in Mobile Ad hoc Sensor Networks", Int'l Journal of Mobile Communications, Vol. 5, No. 5, pp. 558-571, 2007.

- D. Walker and S. Latifi, "Software Reliability in Data Portals for Climate Change in Nevada", 19th Int'l Conf. on Software Eng. and Data Eng, June 2010, pp. 140-144.

- Sithy Shameema M. Yasim and Shahram Latifi, "A Simulation-based Study of Low-Density Parity-Check Code," Proc. of 2009 International Conference on Information and Knowledge Engineering, July 2009, pp.576-580.

- Sithy Shameema M. Yasim and Shahram Latifi, "A Study of SCADA Systems and Their Security," Proc. of 2009 International Conference on Information and Knowledge Engineering, July 2009, pp.581-588.

- Venka Palaniappan, Aaron Ponzio, Jean Li, Ding Yuan, Warnick Kernan and Shahram Latifi,   "Statistical Studies on Sequential Probability Ratio Test for Radiation Detection", Conference on Parallel and Distributed Processing Technology and Application, pg 852-857, vol. 2, June 2007.

- X. Wu, S. Latifi, and Y. Jiang, "Markov Reliability Modeling of Star Networks", DPDNS 2007.

- V. Palaniappan, A. Ponzio, J. Li, S. Latifi and D. Yuan, "Statistical Studies on Sequential Probability Ratio Test for Radiation Detection", Int'l Conf. on Parallel and Distributed Processing Techniques and Application, pp. 852-857, 2007.

- D. Bein, W. Bein, V. Jolly and S. Latifi, "Guarding against Web Spoofing and Phishing Attacks", Roe EduNet, IEEE Conference 2006, pp. 106-109.

Dr. Brendan O'Toole

Associate Professor, Department of Mechanical Engineering
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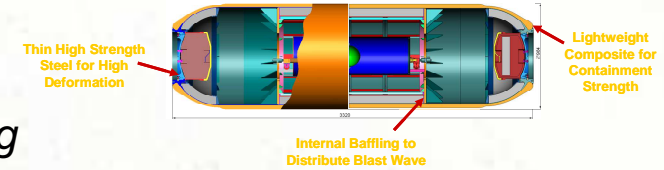
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Specialties

- Structural analysis
- Failure analysis
- Experimental mechanics
- Structural dynamics
- Explosives and impact analysis
- Material characterization
- Computational simulation of highly dynamic events

Dr. Brendan O'Toole

Recent Publications

- J. Thota, B. O'Toole, M. Trabia, "Optimization of Shocks within a Military Vehicle Space Frame", accepted, Journal of Structural and Multidisciplinary Optimization, March 2011.

- S. Sueki, S. Ladkany, B. O'Toole, "Experimental and Computational Study of Acceleration Response in Layered Cylindrical Structure Considering Impedance Mismatch Effect", accepted to Journal of Sound and Vibration, Fall 2010.

- S. Sueki, S. Ladkany, B. O'Toole, "Wave Propagation in Layered Cylindrical Structures Using Finite Element and Wave Tracing Analysis", accepted to Journal of Solid Mechanics and Materials Engineering, Fall 2010.

- K. Clark, B. O'Toole, "Design and Development of Prototype Composite Ducts for Aircraft Components", World Journal of Engineering, v6 sup, pp 161-162, 2009.

- J. Thota, K. Clark, B. O'Toole, "Quasistatic and Vibration Response of Prototype Composite Ducts for Aircraft Components", World Journal of Engineering, v6 sup, pp 1025-1026, 2009.

- J. Thota, M. Trabia, B. O'Toole, and A. Ayyaswamy, "Optimization of Light-Weight Composite Blast Containment Vessel Structural Response", Journal of Pressure Vessel Technology, v131 n3, pp 031209: 1-9, April 2009.

- V. Chakka, M. Trabia, B. O'Toole, S. Sridharala, S. Ladkany, and M. Chowdhury, "Modeling and Reduction of Shocks on Electronic Components within a Projectile", Int. J. of Impact Engineering, v35, pp 1326-1338, 2008.

- R. Mohan, B. O'Toole, J. Malpica, D. Hatchett, G. Kodippili, and J. Kinyanjui, "Effects of Processing Temperature on ReCrete Polyurethane Foam", Journal of Cellular Plastics, V44, n4, July 2008.

- M. Trabia, B. O'Toole, J. Thota, and K. Matta, Finite Element Modeling of a Light-Weight Composite Containment Vessel", Journal of Pressure Vessel Technology, v. 130, n. 1, pp 011205 1-7, February 2008.
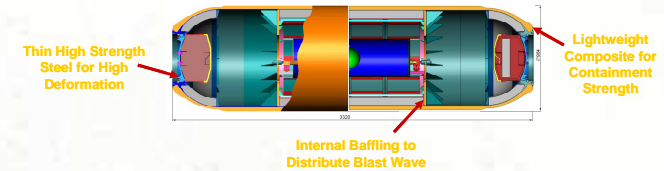
Detection od DU objects

Dr. Emma Regentova

Associate Professor, Department of Electrical & Computer Engineering
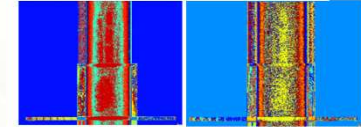
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Specialties

- Pulsed ray radioscopy to detect nuclear materials
- Radioscopic cargo screening using megavoltage energy barriers

Dr. Emma Regentova
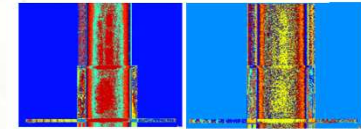
Detection od DU objects

Recent Publications

- Regentova, L. Zhang, V. K.Mandava, A.K. Mandava et al. , Advances and Challenges of Radioscopic Detection of Nuclear Materials in Cargo Containers with Two Megavoltage Energy Barriers, *American Nuclear Society, Radiation Protection and Shielding Division, 2010 Topical Meeting*, April 18-23, 2010, Las Vegas.

- Emma E. Regentova, Lei Zhang, Ajay K. Mandava, Vijay K. Mandava, Kranthi K. Potetti, Gongyin Chen , Zane Wilson, Advantages and Challenges of Radioscopic Detection of Nuclear Materials in Cargo Containers with Two Megavoltage Energy Barriers, will appear in Journal of Nuclear Technology, July 2011

- Mandava, Ajay K.; Zhang, Lei; Regentova, Emma E.; Wilson, Zane; Chen, Gongyin Radioscopic inspection of cargo containers with megavoltage energy barriers, IEEE International Conference on Systems, Man and Cybernetics, 2009. SMC 2009, 11-14 Oct. 2009 Page(s):3510 – 3515.

- L. Zhang, E. E. Regentova, A. Mandava, V. Mandava, S. Curtis, Radioscopic Cargo Screening for Detecting Nuclear Materials with Megavoltage Dual Energy Barriers, HPS 2009 Midyear Proceedings, Recent Advances in Planning and Response to Radiation Emergencies, San Antonio, January 31st, 2009, pp.31-39

Dr. Stephen Rice, CHPIT, PE

Professor, Department of Mechanical Engineering

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Specialties

- Security and Privacy of Health Records
- Secure Electronic Records System (ERS)
- HIPAA Privacy and Security Rules
- Security policy and procedures to ensure legal compliance

Dr. Stephen Rice, CHPIT, PE

Recent Publications

- Rice, S. L. and F. A. Moslehy.   Modeling Friction and Wear Phenomena. Wear, 206: 136-146.

- Grogan, A. L., V. H. Desai, F. C. Gray III, and S. L. Rice.   Apparatus for Chemo-mechanical Wear Studies with Biaxial Load and Surface Charge Control. Wear, 152: 383-393.

- Zhang, J., F. A. Moslehy, and S. L. Rice.   A Model for Friction in Quasi-Steady-State-Sliding, Part I: Derivation. Wear, 149:1-12

- Seif, M. A., P. J. Mohr, F. A. Moslehy and S. L. Rice.   Deformation and Strain Fields in Pin Specimens in Sliding Contact by Laser Speckle and Metallographic Techniques, ASME. Trans., J. Tribology, 122:506-513.

- Wayne, S. F., F. P. Massicotte and S. L. Rice.   Metallography Applied to the Study of Impact-Sliding Wear. Microstructural Science, 13:221-235.

- Rice, S. L., W. F. Bailey, M. Roto, S. F. Wayne. Wear Behavior of a Composite Restorative and Various Styli in Sliding Contact. J. Dental Research, 63(6):932-935.

- Rice, S. L., W. F. Bailey, S. F. Wayne, J. A. Burns. Comparative In-Vitro Sliding Wear Study of Conventional, Micro-filled and Light-Cured Composite Restoratives. J. Dental Research, 63(9): 1173-1175.

- Rice, S. L., W. F. Bailey, S. F. Wayne, and M. Roto. Influence of Variation in Contact Stress on the Sliding-Wear Behavior of a Dental Amalgam. J. Biomaterials, 2(1):46-48.

Dr. Aly Said, P.E.

Assistant Professor, Civil and Environmental Engineering
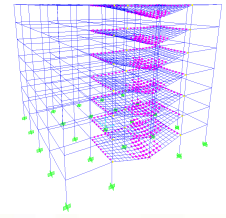
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Specialties

- Progressive collapse of reinforced concrete frame and flat-plate (beamless) structures
- Static and dynamic loading tests of reinforced concrete beams

Dr. Aly Said, P.E.

Recent Publications

- Saad, A., Said, A., and Tian, Y. (2008). "Overview of Progressive Collapse Analysis and Retrofit Techniques," *5th International Engineering and Construction Conference (IECC'5)*, Irvine, California, August 27-29.

- Saad, A., Said, A, and Tian, Y. (2009), "Comparison of Different Standards for Progressive Collapse Evaluation Procedures at Various Seismic Conditions," *5th International Conference in Structural Engineering and Construction (ISEC-5)*, Las Vegas, Nevada, September 21-27.
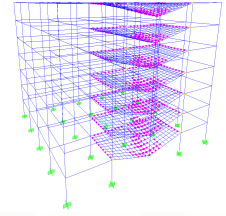
Dr. Robert Schill

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Director, Energy Materials Interaction Technology Initiative of Nevada (EMITION) Center

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Specialties

- Pulsed power and plasma physics
- Microwaves and optics
- Materials science

Dr. Robert Schill

Recent Publications

- "Shaoru Garner, Nathan Lehman, and Robert A. Schill, Jr., *Spatial Distribution of Electron Stimulated Electron Desorption from a Metal Surface*, 2008 IEEE International Power Modulator and High Voltage Conf., (ed. Hulya Kirkici),Las Vegas, NV, May 27-31, 2008, p. 303-306.

- Shaoru Garner, Robert A. Schill, Jr., and Gopi Krishna Ari, *Electron Stimulated Secondary Electron Emission from a Warm Metal Surface,* 2009 International Conference of Plasma Science, San Diego, California, May 31 - June 5, 2009.

- A. Al Agry, R. A. Schill, Jr., S. Garner, S. Andersen, and K. Buchanan, *Electromagnetic Dot Sensor – Calibration*, 2009 17th IEEE Int. Pulsed Power Conf. (PPC 2009), Washington DC, June 28- July 2, 2009, pp. 1348-1353.

Patents

- Patented UNLV EM-Dot – US Patent Number: 7,482,814 [1/27/2009] and subject to International Patent Application No.: PCT/US2006/033453 based on U.S. Patent Application No.: 11/213,628.

Dr. Ying Tian

Assistant Professor, Department of Civil and Environmental Engineering
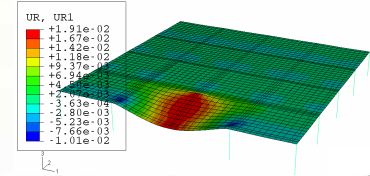
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Howard R. Hughes College of Engineering
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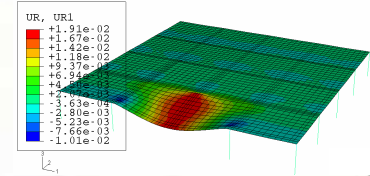*Las Vegas, NV 89154*

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Specialties

- Progressive collapse of reinforced concrete frame and flat-plate (beamless) structures
- Static and dynamic loading tests of reinforced concrete beams

Dr. Ying Tian

Recent Publications

- Widianto, Bayrak, O., Jirsa, J. O., and Tian, Y. (2010). "Seismic Rehabilitation of Slab-Column Connections," ACI Structural Journal, 107 (2), 237-247.

- Su, Y., Tian, Y., and Song, X. (2009). "Progressive Collapse Resistance of Axially-Restrained Frame Beams," *ACI Structural Journal*, 106 (5), 600-607.

- Saad, A., Said, A, and Tian, Y. (2009), "Comparison of Different Standards for Progressive Collapse Evaluation Procedures at Various Seismic Conditions," *5th International Conference in Structural Engineering and Construction (ISEC-5)*, Las Vegas, Nevada, September 21-27.

- Tian, Y., Jirsa, J. O., and Bayrak, O. (2009). "Nonlinear Modeling of Slab-Column Connections under Cyclic Loading," ACI Structural Journal, 106 (1), 30-38.

- Su, Y. and Tian, Y. (2009). "Experimental Study of Reinforced Concrete Slab-CFT Column Connections," 5th International Conference in Structural Engineering and Construction (ISEC-5), Las Vegas, Nevada, September 21-27.

- Saad, A., Said, A., and Tian, Y. (2008). "Overview of Progressive Collapse Analysis and Retrofit Techniques," *5th International Engineering and Construction Conference (IECC'5)*, Irvine, California, August 27-29.

- Tian, Y., Jirsa, J. O., and Bayrak, O. (2008). "Strength Evaluation of Interior Slab-Column Connections," ACI Structural Journal, 105 (6), 692-700

- Tian, Y., Jirsa, J. O., Bayrak, O., Widianto, and Argudo, J. F. (2008). "Behavior of Slab-Column Connections of Existing Flat-Plate Structures," ACI Structural Journal, 105 (5), 561-569.

Dr. Mohamed Trabia

Professor, Department of Mechanical Engineering
Associate Dean for Research, Graduate Studies, and Computing
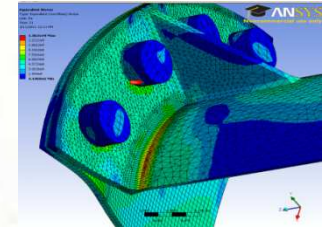
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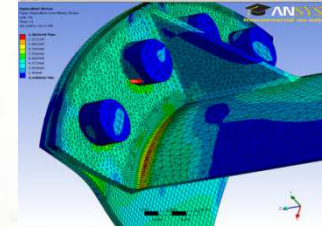
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Specialties

- Structural analysis
- Failure analysis
- Experimental mechanics
- Structural dynamics
- Explosives and impact analysis
- Material characterization
- Computational simulation of highly dynamic events

Dr. Mohamed Trabia

Recent Publications

- J. Thota, B. O'Toole, M. Trabia, "Optimization of Shocks within a Military Vehicle Space Frame", accepted, Journal of Structural and Multidisciplinary Optimization, March 2011.

- J. Thota, M. Trabia, B. O'Toole, and A. Ayyaswamy, "Optimization of Light-Weight Composite Blast Containment Vessel Structural Response", Journal of Pressure Vessel Technology, v131 n3, pp 031209: 1-9, April 2009.

- V. Chakka, M. Trabia, B. O'Toole, S. Sridharala, S. Ladkany, and M. Chowdhury, "Modeling and Reduction of Shocks on Electronic Components within a Projectile", Int. J. of Impact Engineering, v35, pp 1326-1338, 2008.

- M. Trabia, B. O'Toole, J. Thota, and K. Matta, Finite Element Modeling of a Light-Weight Composite Containment Vessel", Journal of Pressure Vessel Technology, v. 130, n. 1, pp 011205 1-7, February 2008.

- D. S. Somasundaram, M. B. Trabia, B. O'Toole, and Q. Liu, "Experimental Investigation of Shock Mitigation of Electronic Boards within Projectiles," 2008 ASME International Mechanical Engineering Congress and Exposition, Boston, Massachusetts, November 2008.

- S. Sridharala, M. Trabia, A. Ayyaswamy, B. O'Toole, Q. Liu, and M. Chowdhury, 'Characterization of Electronic Board Material Properties under Impact Loading," 2007 ASME International Mechanical Engineering Congress and Exposition, Seattle, Washington, November 2007.

- U. Sakaray, B. O'Toole, and M. Trabia, J. Thota "Optimization of a Vehicle Space Frame under Ballistic Impact Loading," 33rd Design Automation Conference, Las Vegas, Nevada, September 2007.

Additional Resources

- Center for Materials and Structures
  http://www.egr.unlv.edu/~bj/CMS/CMS_Home.htm

- Energy Materials Interaction Technology Initiative of Nevada (EMITION) Center
  http://emandpplabs.nscee.edu/home1/index.htm

- Center for the Advanced Study of Algorithms (CASA)
  http://www.egr.unlv.edu/~bein/casa/

- *Center for Information and Communications and Technology (CICT)*
  http://cict.unlv.edu/

Radar Vision