

# K I M B E R L Y   B E L L I

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## E D U C A T I O N A L   E X P E R I E N C E

**Northeastern University** Boston, MA  
**Doctor of Philosophy**, interdisciplinary engineering program: civil engineering, computational electromagnetics and computer aided engineering. **Dissertation:** “Integrated Sensor and Media Modeling Environment for Civil Infrastructure.” (tentative title) **Graduation Date:** December 2007 (expected).

**Northeastern University** Boston, MA  
**Master of Science** in Civil Engineering (emphasis in Structural Engineering). **Thesis:** “Improving the Investigation of Bridge Deck Condition: From Ground Penetrating Radar to a Proposed Defect Assessment Tool.” **Graduation Date:** August 2002.

**Worcester Polytechnic Institute** Worcester, MA  
**Bachelor of Science** in Civil Engineering. **Graduation Date:** May 1997.

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## P R O F E S S I O N A L   E X P E R I E N C E

**Northeastern University** Boston, MA  
*Graduate Research Assistant, GAANN Fellow* 2000–present  
Intelligent diagnostics of structural systems: using Ground Penetrating Radar (GPR) to assess the subsurface condition of reinforced concrete bridges.

- developed a model based assessment technique to determine layer thicknesses and electromagnetic properties of bridge decks.
- designed an approach to remove strong scattering from reinforcing bars (rebar) in bridge deck GPR data, including compensation for the rebar scattered field incident on an anomaly, which can introduce complications in conventional inversion methods.
- devised a method to improve condition assessment in the top few inches of a bridge deck using accepted, existing software.
- developed of a flexible, object-oriented 2D Finite Difference Time Domain (FDTD) algorithm for simulation of GPR on bridge decks.

**Infrasense, Inc.** Arlington, MA  
*Staff Engineer* Summer 2004  
Analyzed GPR data for statewide highway condition survey of 3500 lane miles in Oklahoma.

**Raytheon Systems Company** Burlington, MA  
*DASR Project Engineer, Team Lead* 1998–2000  
Assessed locations for placement of Digital Airport Surveillance Radars on various airport and military sites. Surveyed sites, analyzed radar coverage of candidate sites and prepared reports for site selection.

**CASE/LEA Engineers**, Boston, MA - *Staff Engineer* 1997–1998  
**New England Design Associates**, Worcester, MA - *Summer Intern* Summer 1996  
**Bechtel Corporation**, Boston, MA - *Intern* Jan-Jun 1995

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 P U B L I C A T I O N S

**Belli, K.**, Zhan, H., Wadia-Fascetti, S. and Rappaport, C., (TO BE SUBMITTED AUGUST 2007). “Comparison of the Accuracy of 2D versus 3D FDTD Air-Coupled GPR Modeling of Bridge Deck Deterioration.”

**Belli, K.**, Rappaport, C., and Wadia-Fascetti, S. (TENTATIVELY ACCEPTED JULY 2007). “Forward Time Domain Ground Penetrating Radar Modeling of Scattering from Anomalies in the Presence of Steel Reinforcements”. Submitted to *Research in Nondestructive Evaluation*. Submitted April 2007.

**Belli, K.**, Wadia-Fascetti, S., and Rappaport, C. (TENTATIVELY ACCEPTED JUNE 2006). “Bridge Deck Condition Assessment Using GPR: a model based approach”. Submitted for review to *Journal of Computer-Aided Civil and Infrastructure Engineering*. Blackwell Publishers. Submitted December 2005.

**Belli, K.**, Wadia-Fascetti, S., and Rappaport, C. (2006). “Analysis of Simulated Variation in Dielectric Properties of Reinforced Concrete Systems”. *Applications of Advanced Technology in Transportation (AATT) 2006*. Chicago, Illinois, August 13–16, 2006. In proceedings.

**Belli, K.**, Wadia-Fascetti, S., and Rappaport, C. (2004). “Integrated Modeling Environment for Subsurface Sensing”. *Smart Structures*. Seoul, South Korea.

Wadia-Fascetti, S., Grivas, D., **Belli, K.**, and Lebeau, K. (2002). “Defect Diagnosis and Impact on Bridge Performance”. *First International Conference on Bridge Maintenance, Safety and Management (IABMAS) 2002*. Barcelona, Spain, July 14–17, 2002. In proceedings.

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 L E A D E R S H I P   E X P E R I E N C E

- **Instructor.** Finite Difference approximation of PDEs (short course) Fall 2007
- **Advisor.** Supervised undergraduate independent study in GPR simulation Fall, Winter 2006
- **Mentor.** Research Experience for Undergraduates (REU) Program Summer 2006
- **Webmaster & Content Developer.** Connections E-Mentoring Program 2000–2005
- **Student Leadership Council.** Center for Subsurface Sensing & Imaging Systems 2001
- **Leader & Curriculum Developer.** Connections Take-Apart Computers Seminar 2001
- **President.** WPI Social Committee 1996–1997
- **Committee Member.** WPI Student Activities Executive Council 1996–1997
- **Treasurer.** WPI Social Committee 1994–1996

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 H O N O R S   &   A W A R D S

- **Graduate Assistance in Areas of National Need (GAANN) Fellowship** in Sensing, Identification, Diagnostics & Rehabilitation of Structural Systems - includes full tuition and stipend (2004–present)
- **Outstanding Graduate Student Research Award** at the Northeastern Research & Scholarship Exposition (March 2006)
- **National Science Foundation Travel Grant** to NATO Advance Study Institute in Albena, Bulgaria (May 2005)
- **Alpha Psi Omega Membership** awarded into the national dramatic honor fraternity (Fall 1999)
- **Crimson & Grey Recognition Award** for contribution & dedication to WPI and the enrichment of student life (April 1997)

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S O C I E T Y   M E M B E R S H I P S

American Concrete Institute (ACI), American Society for Nondestructive Testing (ASNT), American Society of Civil Engineers (ASCE), Institute of Electrical and Electronics Engineers (IEEE), Society for Industrial and Applied Mathematics (SIAM), and Society of Women Engineers (SWE).