

# JACK TOTH, PH.D.

931 Blackwood Avenue  
Tallahassee, FL 32303  
USA

Home (850) 350-9551  
Work (850) 644-0854  
Fax (850) 644-0867  
E-mail Jack@Toth.net

Online-resume: Jack.Toth.net

---

## SUMMARY AND OBJECTIVE

I am a highly motivated civil engineer with a broad cross-disciplinary background in the fundamental and applied sciences of engineering especially physics, computer science and information technology. It is my primary objective to advance engineering and its predictive model-based simulations by integrating, fostering, and taking full advantage of today's teraflop and tomorrow's petaflop high-performance computing environment and its technologies.

## EDUCATION

Dresden University of Technology, Germany  
Department of Civil Engineering

Institute for Structural Mechanics and Computational Science:

- **Ph.D.** in Civil Engineering, September 1999  
Thesis: Dynamic behavior of railway bridges and technical application of the program system LAbEB  
Sponsor: Deutsche Bahn AG, Munich, Germany
- **M.S.** in Civil Engineering and in Architectural Engineering, Diploma, October 1995  
Thesis: Including thin-walled beam elements in the FALT-FEM1-PC program system  
Majors: Structural Engineering / Structural Mechanics  
Computing in Construction
- **B.S.** in Civil Engineering and in Architectural Engineering, Preliminary Diploma, October 1992  
Thesis: Developing software tools for the data analyses of the program system STATRA  
Electives: Technical drawing/descriptive geometry  
Computer-aided design (CAD)

## CERTIFICATION

Board of Professional Engineers, State of Florida, USA:

- "Engineer Intern," No. 1100007101, April 2001

Florida State University, USA

Program for Instructional Excellence:

- "2000 Professional Development Certificate," September 2000
- "Advanced Teaching Certificate," September 2000
- "2000 Instructional Technology Certificate", May 2000  
Web-Based Distance Learning/Instruction

## RESEARCH INTERESTS

High-performance computing, model-based simulation, real-time monitoring, finite element analysis, digitizing, reverse engineering, mesh adaptation, parameter optimization, memory hierarchies and parallelism, visualization of scientific results, software and network programming, crashworthiness, structural mechanics, electro-dynamics, magnetism, thermodynamics and numerical methods.

## PROFESSIONAL EXPERIENCE

4/2001 to Present

### Assistant Scholar/Scientist

National High Magnetic Field Laboratory, Florida State University  
Magnet Science and Technology Department

- Applied leading commercial finite element code & advanced and developed codes at the NHMFL for research, development, design, and optimization of unique magnet systems including the electromagnetics, the structural support, and the cryogenic systems.
- Prepared and documented complex analysis and numerical computations for cross-disciplinary projects such as:
  - ”NHMFL/NSCL Sweeper Magnet” (superconducting dipole),
  - ”Repetitively Pulsed Magnet” (bi-metallic split pair),
  - ”NHMFL Wide Bore 900 MHz Magnet” (SC magnet system),
  - ”Upgrade of existing NHMFL Resistive Magnets” (boosting world record fields to 35 & 32 Tesla in new 32 & 50 mm bore magnets),
  - ”Preliminary Design of a Magnetic Bottle” (high power solenoids),
  - ”Conceptual design of large external UNO detector magnet,”
  - ”CAPS 100 MJ Superconducting Magnetic Energy Storage,”examining, studying, evaluating, tuning and optimizing:
  - Electromagnetic field and force distributions (DC/AC/transient),
  - EM shielding (DC), eddy current damping & skin effects (AC),
  - Heat transfer and thermodynamics (structural/cryogenics),
  - Structural stress/strain distributions (statics/dynamics).
- Raised the level of sophistication of the numerous applications of model-based simulations introduced at the NHMFL for predictive FEA of the various complex magnet systems (listed above) and presented the diverse innovative techniques and methods at seminars and international conferences.
- Drafted and prepared various technical reports facilitating corresponding NHMFL report and proposal activities to major sponsors such as the NSF or other external review committees.
- Actively supported and enriched the NHMFL Educational Tours & Outreach program by acting as a certified tour guide at various site visits and organizing, facilitating, and presenting at selected NHMFL Open House events.

10/1999 to 3/2001

Postdoctoral Research Associate

FAMU-FSU College of Engineering, Florida State University, USA  
Institute for Transportation Technologies

- Supervised several large cross-disciplinary research projects conducted at the Crashworthiness and Impact Analysis Laboratory (CIAL), sponsored by the FDOT & FHWA:
  - ”Investigation of Piezoelectric Sensors for Traffic Monitoring,”
  - ”Crashworthiness of Public Transportation Buses,”
  - ”Vehicle Trajectories Traversing FDOT Curbs,”
  - ”Investigation of Bridge Fender Systems for Vessel Impact.”
- System administrator of high performance computing environment.
- Completed ”FARO Certified User Training” for FARO Arm 3D-digitizing tools and AnthroCam design software.
- Prepared several research proposals for funding and grants for the Institute for Transportation Technologies.
- Developed and maintained CIAL websites.
- Taught lectures & seminars of undergraduate & graduate courses:
  - ”Advanced Structural Analysis” (CES 4101/5106),
  - ”Structural Stability” (CES 5218).
- Prepared and delivered course materials, conducted classroom interaction applying a web-based long-distance learning environment (Blackboard/CourseInfo).

10/1995 to 9/1999

Graduate Research Associate

Dresden University of Technology, Germany  
Institute for Structural Mechanics and Computational Science

- Researched and taught selected topics of dynamics at the Chair for Dynamics of Structures.
- Developed instructional course materials for the lectures in ”Dynamics of Structures” and ”Numerical Methods” at the Department of Civil Engineering.
- Tutored student trainees and diploma degree candidates in existing hardware and software packages and in program developing.
- Supervised Computer Laboratory (PC’s & Mainframes).
- Developed computer software for various special areas in civil engineering, especially the program system LAbEB for the analysis of the dynamic behavior of railway bridges.
- Presented research results and coordinated public relations with our partner University in Budapest, Hungary.
- Prepared numerous studies of special buildings applying nondestructive measuring methods & real time monitoring.
- Performed extensive static/dynamic analysis and model-based simulations of complex engineering structures including human-induced vibrations and excitations caused by external sources.

1/1992 to 9/1999

Assistant and Consulting Engineer

Engineering Company György Tóth, Dresden, Germany  
Supervised Computer section (System & CAD) and provided consulting by various expertises for planning of building maintenance including damp-proof and thermal insulation.

1/1994 to 9/1995

Computer Programmer

Engineering Company Friedrich&Lochner, Stuttgart, Germany

- Developed professional software modules for the dimensioning of steel structures and their pins of frameworks.
- Utilized existing software resources including the company's complex profile data base.

12/1993 to 9/1995

Research Assistant

Dresden University of Technology, Germany  
Institute for Structural Mechanics and Computational Science  
Developed software modules and tools for data analyses of the Finite-Element program systems FALTFEM and STATRA.

**COMPUTER  
SKILLS**

Operating Systems:

AIX, DOS, Linux, Unix, Windows 95/NT/2000.

Programming Languages:

Basic, C/ C++, Fortran, Java, Pascal.

Internet Programming:

HTML (including CSS and DHTML), Javascript.

Engineering Applications:

Ansys, Patran, LS-Dyna/Ingrid, SAP2000, Truegrid, VectorFields.

Numerous Applications for each of the various fields:

Drawing: AutoCAD, AnthroCAM & Faroarm, Xfig ,

Solving: Excel, Gnuplot, Mathematica, Matlab ,

Word processing: Emacs, Latex, vi, WP, Word .

**LANGUAGES**

German, English, Hungarian, Russian.

**PROFESSIONAL  
MEMBERSHIPS**

Institute of Electrical and Electronics Engineers, Inc. (IEEE)

◦ Magnetics Society (IEEE-MS),

◦ Computer Society (IEEE-CS).

American Society of Civil Engineers (M.ASCE)

◦ Structural Engineering Institute (ASCE-SEI).

Association of German Engineers (VDI)

◦ Structural Engineering (VDI-BT).

**SPECIAL  
ABILITIES**

Solving complex cross-disciplinary problems in high-performance computing environments and integrating latest research techniques.

**HOBBIES AND  
INTERESTS**

In my spare time, I like to read fiction and poetry, to listen to modern and classical music, and to meet with friends.

For more intensive recreation I prefer traveling, hiking, riding, swimming, fishing - to sum up, all the possible activities of the tremendous and unique National Parks of the United States.

**SLOGAN**

' We are responsible for the things we do,  
but also for the things we omit. ' *Voltaire*

**EVALUATION**

There is an Educational Credential Evaluation for the diplomas by an officially authorized American company, which confirms that they are equivalent to corresponding degrees offered by an accredited university in the United States.

## 2003 PUBLICATIONS & SCIENTIFIC ACTIVITIES

### Peer-Reviewed Publications

- "Convergence Studies of D-Shaped Coil/Bobbin Interactions in a Sweeper Magnet." Jack Toth and Mark D. Bird. Presented at: 9th Applied Superconductivity Conference, Houston, Texas, USA, August 4-10, 2002. Published in: *IEEE Transactions on Applied Superconductivity*. Vol 13, no. 2, June, 2003, pp. 1400-1403.
- "Bucket Testing of a Compact Sweeper Magnet for Nuclear Physics." Mark D. Bird, Iain R. Dixon, Andrew V. Gavrilin, Jack Toth, and Al Zeller. Presented at: 9th Applied Superconductivity Conference, Houston, Texas, USA, August 4-10, 2002. Published in: *IEEE Transactions on Applied Superconductivity*. Vol 13, no. 2, June, 2003, pp. 1250-1253.

### Conference Proceedings

- "The Role of Advanced Model Based Simulations in Light of a Review of Diverse Engineering Challenges." Jack Toth. *Festschrift: Prof. Dr.-Ing. Peter Ruge 60 Jahre*, Dresden University of Technology, Germany, June 2003, pp. 265-290.
- "Generation of the Highest Continuous Magnetic Fields." Hans J. Schneider-Muntau, Jack Toth, Huub W. Weijers. Presented at: 18th International Conference on Magnet Technology, Morioka, Japan, October 20-24, 2003. Submitted for publication in: *IEEE Transactions on Applied Superconductivity*. October 20, 2003.
- "Design of the Next Generation of Florida-Bitter Magnets at the NHMFL." Mark D. Bird, Iain R. Dixon, and Jack Toth. Presented at: 18th International Conference on Magnet Technology, Morioka, Japan, October 20-24, 2003. Submitted for publication in: *IEEE Transactions on Applied Superconductivity*. October 20, 2003.
- "Cryostat Design & Fabrication for the NHMFL/NSCL Sweeper Magnet." Mark D. Bird, Jack Toth, et al. Presented at: 18th International Conference on Magnet Technology, Morioka, Japan, October 20-24, 2003. Submitted for publication in: *IEEE Transactions on Applied Superconductivity*. October 20, 2003.

### Research Reports

- "Documentation of Diverse Structural FEA of the Wide Bore 900 MHz Magnet Cryostat." Jack Toth. *Design Documentation and Presentation*, National High Magnetic Field Laboratory, Florida State University, January 2003 (26 pages).

## 2002 PUBLICATIONS & SCIENTIFIC ACTIVITIES

### Peer-Reviewed Publications

- "Final Design and Testing of a Compact Sweeper Magnet for Nuclear Physics." Jack Toth et al. Presented at: 17th International Conference on Magnet Technology, Geneva, Switzerland, September 24-28, 2001. Published in: *IEEE Transactions on Applied Superconductivity*. Vol 12, no. 1, March, 2002.

## Research Report

- "Electromagnetic and Structural Design of the Sweeper Magnet System." Jack Toth and Mark D. Bird. *Design Documentation and Presentation*, National High Magnetic Field Laboratory, Florida State University, July 2002 (62 pages).

## 2001 PUBLICATIONS & SCIENTIFIC ACTIVITIES

### Peer-Reviewed Publications

- "Retrofit of Bridge Fender Systems." Rafal Wuttrich, Jerry W. Wekezer, Jack Toth, Nur Yazdani. *ASCE Journal of Waterway, Ports, Coastal and Ocean Engineering*. November 2001.
- "Spectral Assessment of Mesh Adaptations for the Analysis of the Dynamical Longitudinal Behavior of Railway Bridges." Jack Toth and Peter Ruge. *Research Journal: Archive of Applied Mechanics*. Springer, Berlin, Germany. Vol 71 (2001): pp. 453-462.

## 2000 PUBLICATIONS & SCIENTIFIC ACTIVITIES

### Journal Papers & Conference Proceedings

- "Longitudinal Dynamics of Railway Bridges due to Braking Forces," (in German). Jack Toth and Peter Ruge. *Wissenschaftliche Zeitung*. Dresden University of Technology, Germany. Vol. 49 (2000) issue 3: pp. 57-64.
- "Crashworthiness of Bridge Fenders Impacted by a Barge." Rafal Wuttrich, Jerry W. Wekezer, Nur Yazdani, Jack Toth. 14th Engineering Mechanics Conference, *EM2000*, ASCE. Conference Proceedings on CD. Programs and Summaries of Presentations: p. 75. Austin, TX, May 21-24, 2000.
- "LS-DYNA Analysis and Retrofit of Bridge Fender Systems." Rafal Wuttrich, Jerry W. Wekezer, Nur Yazdani, Jack Toth. *TRANSPO 2000*. Conference Proceedings on CD. Summaries of Presentations: p. 146. Orlando, Florida, April 16-19, 2000.

### Invited Lecture

- "Crashworthiness and Roadside Safety." Jerry W. Wekezer and Jack Toth. Presentation and publication in the 18th Annual Seminar, *Special Problems in Traffic Crash Reconstruction*, Institute of Police Technology and Management, University of North Florida, Jacksonville, May 1-5, 2000.

### Sponsored Research

- "Establishing a Center of Excellence in Computational Mechanics." Jerry W. Wekezer and Jack Toth. Proposal to *Federal Highway Administration (FHWA)*, Solicitation No. RFA DTFH61-00-R-00084, May, 2000.
- "Adaptation of Inverse Analysis and Optimization Methods to the Design Process for Roadside Safety Structures." Jerry W. Wekezer and Jack Toth. Proposal to *U.S. Department of Transportation*, Solicitation No. RFA DTFH61-00-R-00028, May, 2000.

- **"Material Models for MBS of Bridge Fenders."** Jerry W. Wekezer and Jack Toth. Proposal to *National Science Foundation (NSF)*, Solicitation No. NSF-00-26, February, 2000.
- **"Computer Analysis of Ballistic Protection of Tentage and Rigid Wall Shelters."** Jerry W. Wekezer and Jack Toth. Proposal to *U.S. Army Natick Soldier Center*, Solicitation No. DAAD16-99-R-1006, January, 2000.

## **GRADUATE STUDIES & RELATED PUBLICATIONS (1995-1999)**

### Ph.D. Thesis

- **"Dynamical Longitudinal Behavior of Railway Bridges Caused by Braking Forces."** Jack Toth. Ph.D. Thesis (in German). *Dresden University of Technology, Germany*. Sep, 1999.

### Peer-Reviewed Publications

- **"Dynamical Longitudinal Behavior of Railway Bridges."** Peter Ruge, Ulf Pahnke and Jack Toth. *Structural Dynamics - Eurodyn '99*. Conference Proceedings. Vol. 2: pp. 657-662. Prague, Czech Republic, June 7-10, 1999.

### Research Report

- **"Dynamical Longitudinal Behavior of Railway Bridges Caused by Braking Forces."** Jack Toth and Peter Ruge. *Final Report and Presentation*, Dresden University of Technology, Germany, March 1999 (in German, 232 pages).

Note: Research results, achieved during the 4 year contract (TUD-D5), were considered by the sponsor as proprietary and were not published.