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1. EDUCATION

Ph.D /Civil (Geotechnical) Engineering Polytechnic University (http://www.poly.edu) Dissertation: Visualization of 3D Deformations Using Transparent "Soil" Models	Jan. 2003
Ph.D. /Civil (Geotechnical) Engineering Tongji University (http://www.tongji.edu.cn) Dissertation: Centrifugal Modeling of Excavation in Soft Clay	Oct. 1999
M.S./Civil (Structural) Engineering Nanjing Hydraulic Research Inst. (http://www.nhri.cn) Thesis: Spectrum & Time Series Method in Structural Health Evaluation	July 1995
B.S. / Civil (Structural) Engineering Hohai Univ. (http://www.hhu.edu.cn)	July 1992

2. WORK EXPERIENCE

July 2007- Now	Ryerson University	Toronto, ON
Associate Professor (Assistant Professor from July 2007 to February 2012)		
Working on geotechnical engineering teaching and research at Department of Civil Engineering.		
<ul style="list-style-type: none">▪ Building up a geotechnical research team and a GeoOptical Research Lab▪ Teaching graduate and undergraduate courses<ul style="list-style-type: none">• CVL320-Strength of Materials-I• CVL434-Geotechnical Properties of Soils• CVL600-Geotechnical Engineering• CV8310-Advanced Foundation Design• CV8309- Earth Retention System• CV8309- Mechanized Tunnelling in Urban Areas▪ Conducting geotechnical engineering research in many fronts, including<ul style="list-style-type: none">• Anchor behaviour using DIC• Negative skin friction in pile• Stereo-PIV for 3D soil deformation measurement• Extend transparent soil in more advanced geotechnical research• Deep excavation and tunnelling in urban setting		
Oct. 2005- June 2007	Jacobs Engineering Group	Detroit, MI
Tunnel Engineer		
Worked on Upper Rouge Tunnel (URT) Project, a 12 km long 9 m diameter tunnel in Detroit.		
<ul style="list-style-type: none">▪ Performed lining design and analyses for all the tunnels, chambers, adits, and shafts		

- Designed contract drawings for tunnel plan and profile and tunnel linings
- Involved in supplemental geotechnical investigation and SBOD report
- Coordinated design activities among design teams and subconsultants
- Supervised staff engineers

Worked on Stanford Linear Accelerator project, a drill-and-blast rock tunnel project in CA.

- Analyzed tunnel lining using GT-Strudl with tension cut-off springs

Nov. 2002 –Oct.2005 **STV Inc.**
Senior Geotechnical Engineer

New York, NY

Worked on East Side Access (ESA) Project, a \$ 6.8b transit tunnel project in NYC.

- Led lining analysis and design for TBM tunnel in soft ground
- Designed the cut-and-cover tunnel and U-box structures by GT Strudl
- Designed and detailed the RC segmental liner using MicroStation
- Studied workable underpinning schemes for different structures
- Numerically analyzed of interaction between closely spaced tunnels

Worked on Chicago Transit Authority Block 37 project, a transit tunnel project in Chicago.

- Modeled soil-tunnel interaction using Plaxis and designed reinforced concrete frames

1999 – 2002 **Polytechnic University**
Research Assistant and Teaching Assistant

Brooklyn, NY

Research on NSF project (\$320,000) "Career: Modeling 3D Flow and Soil Structure Interaction Using Optical Tomography." This project involves making two kinds of transparent materials to model sands and clays and obtaining flow and deformation pattern inside non-intrusively. Images of the laser speckle generated by the interaction of laser light and transparent soils are captured before and after deformation to obtain soil deformation field non-intrusively using digital image correlation method. A model consisting of a layer of transparent "sand" overlying a layer of soft "clay" is used in the study. Results showed that transparent soils and developed optical system are capable in modeling soil deformation and flow problems in natural soils. This research has attracted interests from researchers world-wide, including US, UK, Australia, Germany, and Israel.

Taught undergraduate laboratories in soil mechanics, foundation design, and surveying.

Supervised two high school interns during two summers.

1996 - 1999 **Tongji University**
Research Assistant and Field Engineer

Shanghai, China

Designed, performed, and analyzed four centrifugal tests to study multi-braced deep excavation with varying excavation parameters, including volume and time. Samples were retrieved from undisturbed soil blocks from a depth of 12m in the field to obtain similar geotechnical properties. Test results show that controlling construction can efficiently reduce the ground loss to protect surrounding properties in urban environment, which supports the widely implemented excavation technique in Shanghai.

In charge of following field research projects related to Shanghai subway construction:

- Supervised compensation grouting protection of 6 buildings (CN¥500k)
 - Supervised dewatering protection of a 73-year-old six-storey building (CN¥600k)
 - Supervised underpinning and grouting protection of a shopping mall (CN¥1M)
 - Designed and analyzed soil properties change due to excavation (CN¥150,000)
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1992 - 1996	Nanjing Hydraulic Research Institute	Nanjing, China
<i>Graduate Student (3 yrs) and Structural Engineer (1 yr)</i>		
<ul style="list-style-type: none"> ▪ Studied spectrum and time series method to assess structural safety of a concrete dam ▪ Analyzed seepage force in Toulinkuo Dam using finite difference method ▪ Preliminary study and design for Sino-American natural gas station in East China Sea ▪ Programmed the database for safety monitoring of Fuchunjiang Dam 		

3. RESEARCH CONTRIBUTION

3.1 Research Publications

More than 70 publications, including 33 journal papers, 36 conference papers, 5 book chapters, 2 conference proceedings, 1 government report. **For a complete publication list, please see [Publication page](#)**. The most representative publications are listed below.

Liu J*, Liu M, Zhu Z. 2012. Sand deformation around an uplifting plate anchor. *Accepted by ASCE, Journal of Geotechnical & Geoenvironmental Engineering*.

Liu J*, Gao H, Liu H. 2012. Finite element analyses of negative skin friction on a single pile. *Acta Geotechnica*, March 2012 Issue

Liu J*, Yuan B, Mai V, Dimaano R. 2011. Sand deformation around a laterally loaded pile, ASTM, *Journal of Testing and Evaluation*, 39(5). DOI: 10.1520/JTE103313.

Liu H, Li P, Liu J. 2011. Numerical investigation of underlying tunnel heave during a new tunnel construction. Elsevier, *Tunnelling and Underground Space Technology*, 26(2), 276-283.

Ding X, Liu H, Liu J, Chen Y. 2011. Wave propagation in a pipe pile for low strain integrity testing. ASCE, *Journal of Engineering Mechanics*, 137(9), 598–609.

Liu J*, Iskander M. 2010. Modelling capacity of transparent soil. *Canadian Geotechnical Journal*, 47(4), 451-460.

Iskander M, Liu J*. 2010. Spatial deformation measurement using transparent soil. ASTM, *Geotechnical Testing Journal*, 33(4), 314-321.

Sui W, Liu J, Yang S, Chen Z, & Hu Y. 2010. Hydrogeological analysis and salvage of a deep coalmine after a groundwater inrush. Springer, *Environmental Earth Science*, 62:735–749.

Liu J, Iskander M. 2009. Speckle photography for measuring 3-D deformation inside a transparent soil model. *Proc. of 17th Int. Conf. on Soil Mech. and Geot. Eng.*

Liu J, Iskander M, Tabe K, Kosterelos K. 2005. Flow visualization using transparent synthetic soils. *Proc. 16th Int. Conf. on Soil Mechanics and Geotechnical Eng.*, Vol.4, 2411-2414.

Liu J, Iskander M, Sadek S. 2003. Consolidation and permeability of Transparent Amorphous Silica. ASTM, *Geotechnical Testing Journal*, 26(4), 390-401.

Liu J. 2003. Compensation grouting to reduce settlement of buildings during an adjacent deep excavation. *Grouting & Ground Treatment*; ASCE GSP120(2), 837-844.

Iskander M, Liu J, Sadek S. 2002. Transparent amorphous silica to model clay. ASCE, *J. of Geotechnical & Geoenvironmental Engineering*, 128(3), 262-273.

3.2 Research Projects

Project 1: Visualization of 3D soil deformation during cone penetration using transparent soil.
Funded by NSERC, 2009-2013

Project 2: Development of guidelines for soil nail walls. Funded by MTO, 2011-2012

Project 3: Ultrasonic NDT of soil nails. Funded by NSERC and supported by DSI Canada,
2012-2012

Project 4: Characterizing dynamic properties of transparent soil. Funded by Hohai Key Lab of
Embankment and Geomechanics, 2009-2011

Project 5: Visualization of deformation development during soft ground TBM Tunnelling.
Funded by State Key Lab in Rock and Soil Mechanics, WHRSI, 2010-2012

Project 6: Visualization of hydrofracturing during grouting.
Funded by State Key Lab in Geomechanics & Deep Underground Eng., CUMT, 2010-2012

4. OTHER EVIDENCE OF IMPACT AND CONTRIBUTIONS

4.1. Awards

1999 Shanghai Science & Tech. Development Award Shanghai Bureau of Infrastructure.

Guanghua Scholarship Tongji University, China, 1997

Liu Jianhang Scholarship Shanghai Metro Company, China, 1998

4.2. Professional Activities

Past Chair of CGS-Southern Ontario Section (Toronto Group), 2011/2012

Chairman of CGS-Southern Ontario Section (Toronto Group), 2010/2011

Session Chair & Co-Editor of GeoHunan 2011 International Conference

Session Chair & Co-Editor of GeoHunan 2009 International Conference

Executive Committee Member of CGS-Southern Ontario Section (Toronto Group), 2008-10

Committee Member of the following educational and technical committees:

- CGS Education Committee (2007-now)
- DFI Technical Committees: Micropile (08-now), Helical Pile (08-now), Tieback & Soil Nailing (08-now), Marie Foundations (08-10); Ground Improvement (08-now)

Paper reviewer for

- **Journals:** *Tunnelling & Underground Space Technology; Geotechnical Testing J.; Environmental Earth Sciences; Automation in Construction; Journal of Performance of Constructed Facilities; J. of Testing and Evaluation; DFI Journal*

Paper reviewer for

- **Conferences:** *Pan AM CGS 2011; CGS GeoEdmonton'08 ; ASCE GeoCongress'08 ; Geohunan'11; Geohunan'09 ; ASCE IFCEE'09 Conferences*

Professional Engineer in the state of CT, WA, & MI in the US and Ontario in Canada
