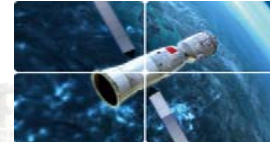




哈爾濱工業大學  
HARBIN INSTITUTE OF TECHNOLOGY



规格严格  
功夫到家



*Presentation for Team-Meeting of Group of Risk and Safety, ETH Zürich*

# Brief Introduction to My Research Projects on Reliability & Risk in HIT

**Dagang LU**

**Prof. Dr. of Harbin Institute of Technology**

**Academic Guest of Group of Risk and Safety, ETH Zürich**

**Zürich, Jan.15, 2009**

# Outline

- **About Harbin and HIT**
- **Brief Introduction to My Research Projects on Reliability and Risk in HIT**
- **Brief Introduction to National Science Foundation of China (NSFC)**
- **A Plan of Myself for the Near Future**

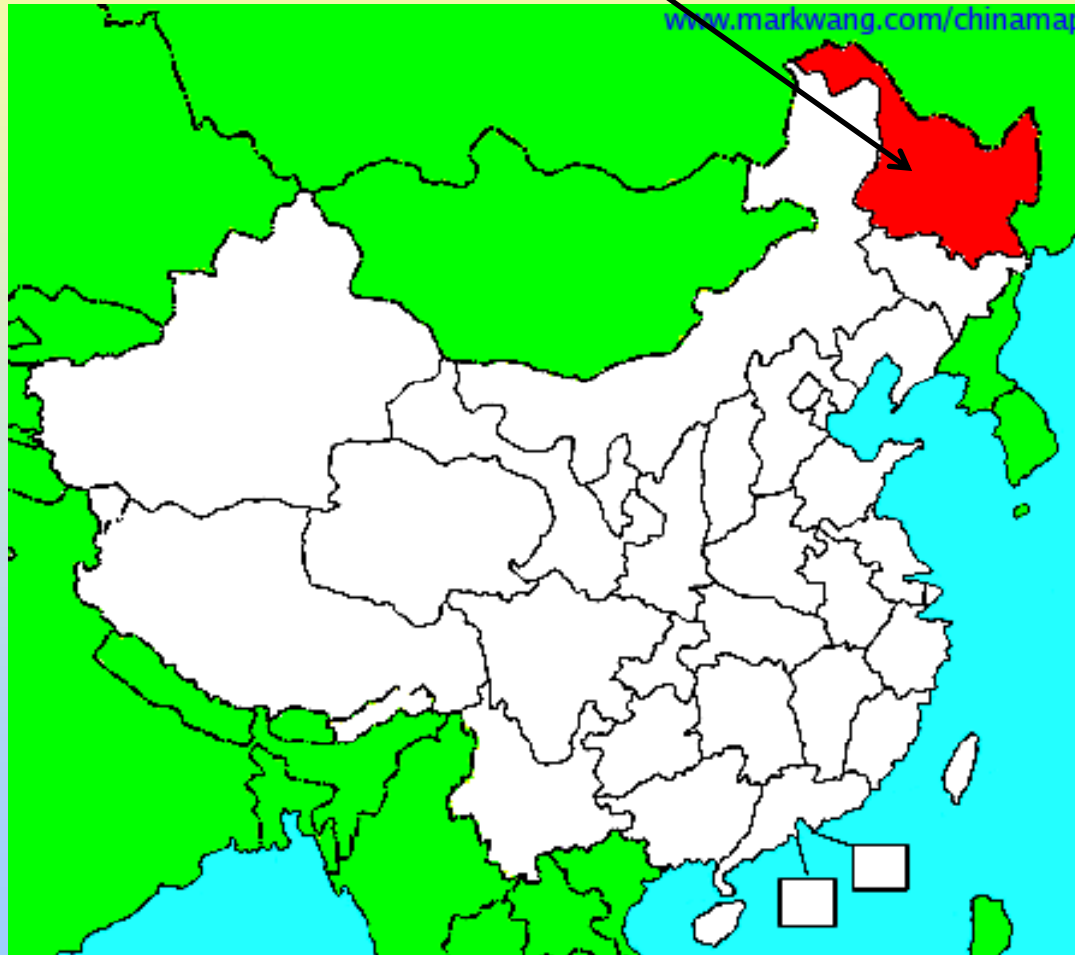
# Where is Harbin?



# Where is Harbin?



# Heilongjiang Province



# Location of Harbin



# Neighbors of Harbin





# Profile of Harbin Institute of Technology (HIT)



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## About

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- Profile of HIT**
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## Profile of HIT

Harbin Institute of Technology (HIT) was founded in 1920. From its beginning, HIT has received the preferential support from the government. In 1954, the Ministry of Higher Education designated, for the first time, six national key universities. HIT was the only one of the six outside of Beijing. In 1984, HIT again found its way onto the list of 15 national key universities to receive special support. In 1996, HIT was in the first batch of universities to be included in Project 211. This project targets 100 institutions of higher education in China to receive preferential support for development in becoming world-class universities in the 21<sup>st</sup> century. In 1999, HIT was listed as one of the top nine key universities in China. This distinction provided HIT with the opportunity to develop into a world-class, first-rate competitive university with the assistance of the Ministry of Education and the Heilongjiang Provincial Government.



After 87 years, HIT has developed into a large multi-disciplinary nationally renowned university with science, engineering and research as its core. We have established our own unique programs related to the field of astronautics that are unparalleled anywhere in China. We broaden our established disciplinary programs by utilizing a cross disciplinary curriculum and as such have formed a comparatively full disciplinary system that consists of key





# Schools and Departments of HIT

**School of Astronautics**

**School of Civil Engineering**

**School of Municipal and Environmental Engineering**

**School of Architecture**

**School of Transportation Science and Engineering**

**School of Mechatronics Engineering**

**School of Material Science and Engineering**

**School of Energy Science and Engineering**

**School of Electrical Engineering and Automation**

**School of Science**

**School of Management**

**School of Computer Science and Technology**

**School of Software**

**School of Electronics and Information Technology**

**School of Humanities and Social Sciences**

**School of International Relations of Eco. & Tr.**

**School of Law**

**School of Food Science and Engineering**

**Dept. of Media Tech. & Art**

# **Brief Introduction to My Research**

## **Projects on Reliability and Risk in HIT**

- Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes**
- Projects on Reliability, Safety and Risk of Infrastructures**

## **Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (1/8)**

- ❑ **Damage Evolution Rules and Collapse Mechanisms of Super High-rise Buildings under Strong Earthquakes through 3D MPA and IDA**
  - Supported by NSFC
  - Period: 2008.01 - 2010.12
  - A fostering project of the Major Research Project “Dynamic Damages of Major Engineering” supported by NSFC
  - Cooperation with Prof. Anil C. Chopra of UC Berkeley on MPA
  - Cooperation with Prof. Michael H. Faber of ETH Zürich on Seismic Safety and Robustness of High-rise Buildings

## Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (2/8)

### □ Seismic Damage and Control of the Third-Generation of Structural Systems

- Supported by Specialized Science and Technology Foundation of China Earthquake Administration (CEA)
- Period: 2008.01 - 2010.12
- Chief of the project
- Participated by 7 Professors and more than 20 PhD students of HIT

## Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (3/8)

### ❑ **Seismic Fragilities of RC Structures Based on Probabilistic Damage Models**

- Supported by NSFC
- Period: 2007.01 - 2009.12
- Chief of the project
- Participated by 2 Post-Docs, 5 PhD students and 6 Master students of my own group

# Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (4/8)

## ❑ Seismic Fragilities of RC Bridges in Beijing

- Supported by Local Science Foundation of Beijing
- Period: 2008.01 - 2010.12
- Co-Chief of the project with Beijing Municipal Engineering Research Institute
- Participated by 1 Post-Docs, 1 PhD students and 2 Master students of my own group

## **Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (5/8)**

### **❑ Decision-making Analysis of the Optimal Target Reliability and Performance-Based Optimum Design of Aseismic Structures**

- Supported by NSFC
- Period: 2002.01 - 2004.12
- Chief of the project
- Participated by 1 PhD students and 5 Master students of my own group



## Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (6/8)

### ❑ **Seismic Performance Design of Steel Frame Structures Based on Global Reliability Theory**

- Supported by Research Start-up Foundation for Returned Scholars from Abroad of Ministry of Education (MOE) of China
- Period: 2007.01 - 2009.12
- Chief of the project
- Participated by 1 PhD students and 3 Master students of my own group

## **Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (7/8)**

### **❑ Nonlinear Seismic Reliability Theory and its Applications for Civil Engineering Structures**

- Supported by Excellent Young Teacher Foundation of HIT
- Period: 2006.01 - 2008.12
- Chief of the project
- Participated by 2 PhD students and 3 Master students of my own group

## **Projects on Damage, Collapse, Reliability and Fragility of Structures under Earthquakes (8/8)**

### **❑ Performance-Based Optimum Design of Aseismic Structures Based on the Optimal Target Reliability**

- Supported by University Science Foundation of HIT
- Period: 2001.01 - 2002.12
- Chief of the project
- Participated by 2 Master students of my own group

## **Projects on Reliability, Safety and Risk of Infrastructures (1/3)**

### **❑ Real-time Monitoring and Safety Evaluation Systems for Concrete Girder Bridges in Beijing**

- Supported by Local Science & Technology Foundation of Beijing
- Period: 2008.01 - 2010.12
- Co-chief of the project with Beijing Municipal Engineering Research Institute
- Participated by 1 Post-doc, 1 PhD students and 2 Master students of my own group

## Projects on Reliability, Safety and Risk of Infrastructures (2/3)

### ❑ Time-dependent Reliability Assessment and Updating of Concrete Girder Bridges

- Supported by Research Start-up Foundation for Returned Scholars from Abroad of Heilongjiang Province
- Period: 2007.01 - 2009.12
- Chief of the project
- Participated by 1 PhD students and 2 Master students of my own group

## Projects on Reliability, Safety and Risk of Infrastructures (3/3)

### ❑ Inspection and Safety Evaluation Techniques for Municipal Pipelines

- Supported by National Science and Technology Supporting Plans of Ministry of Science and Technology (MOST) of China
- Period: 2008.01 - 2010.12
- Co-chief of the sub-project “Safety and Risk Analysis of Pipelines” with the School of Municipal and Environmental Engineering of HIT
- Participated by 1 PhD students and 2 Master students of my own group

# Brief Introduction to NSFC

- General Program
- Key Program
- Major Program
- Major Research Plan
- Funds for Talented Professionals
- International (Regional) Cooperation and Exchange
- Programs of Joint Funds
- Special Funds



# Project Categories of International (Regional) Cooperation and Exchange

- ❑ **Joint Research Project**
- ❑ **Major International (Regional) Cooperation Program**
- ❑ **International Conferences (including those within the framework of MoUs)**
- ❑ **Special Fund for Chinese Scholars Abroad Returning for Short-period of Work or Lecture in China**

# A Plan of Myself for the Near Future

- ❑ Organizing a research center of **R**eliability **A**nd **R**isk **E**ngineering at HIT (**RARE @HIT**)
- ❑ This plan has been supported by the dean and key professors of SCE, HIT
- ❑ Hope to get the support from Michael !
- ❑ Hope to cooperate with Group of Risk and Safety of ETH Zürich continuously in the future!



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**Thanks you for your attention!**

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