

PERSONAL CAREER

NAME: Tadanobu Sato

POSITION: Professors at South East University and Kobegakuin University
Emeritus Professor of Kyoto University
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EDUCATION: Bachelor of Engineering (1969, Civil Engineering, Kyoto University)
Master of Engineering (1971, Civil Engineering, Kyoto University)
Doctor of Engineering (1975, Civil Engineering, Kyoto University)

ACADEMIC EXPERIENCE:

1974-1977 Research Associate, Kyoto University
1977-1994 Associate Professor, Kyoto University
1994-2005 Professor of Kyoto University, DPRI, Kyoto University
2006- Professor of Kobegakuin University
2011- Professor of South East University
1980-1981 Visiting Scholar at UC Berkley
2005-2008 Adjunct Professor of Waseda University
2006-2009 Adjunct Professor of Kansai University
2006-2010 Adjunct Professor of South-East University at Nanjing, PRC

AWARDS:

1991 Thesis Prize on structural control theories from Japan Society of Civil Engineers
2003 Testimonial medal on activities promoting geotechnical engineering development from Japan Society of Geotechnical Engineering
2005 Senior Research Prize on system identification from International Association for Structural Safety and Reliability Analysis
2006 Testimonial medal on activities promoting gas safety from the Ministry of Economy, Trade and Industry, Japan

TEACHING EXPERIENCE:

In Kyoto University : Graduate course ; Application of partial differential equations to civil engineering problems (1978-1995), Soil-structure interaction (1978-1983), Special problems in soil related disaster- (1983-1986), Advanced Geotechnical Engineering (1996-), Lifeline Engineering (1996-2005)

Undergraduate course ; Soil Mechanics (1988-1992), Structural Mechanics (1989-1994, 2001-2005), Geotechnical Engineering (1995-2005)

In Kobegakuin University: Undergraduate course; Introduction to Disaster Reduction (2006-), Theory of Disaster Mitigation (2006-), Probability and Stochastic Theory for Disaster Analyses (2006-), Theory of Disaster Analyses (2006-), Theory of Earthquake Disaster (2006-)

MAJOR RESEARCH FIELDS:

Researches on dynamic constitutive relationship of soil (1978-1986), non-linear soil-structure interaction problem (1971-2005), non-linear seismic response of surface ground (1975-2005), seismic response analysis of surface ground with irregular soil profile (1977-2005), identification and simulation of earthquake motion (1979-), damage estimation of lifeline systems (1980-), optimal control of seismic response of structural systems (1988-2001), health monitoring of structure systems (1986-2008), simulation and modeling of earthquake motion for design code (1972-), education on disaster mitigation (2006-), quantification of socio-disaster problems (2006-)

COMMITTEE MEMBERS (Present activities)

Ministry of Economy, Trade and Industry: Sub-committee on Gas Safety

Railway Technical Research Institute: Chairman of Design Code Development for Railway Facilities

Hanshin Highway Corporation: Council on Technical Advisements

Japan Gas Association: Co-chairmen of Code Development and Survey on Gas Facilities

Japan Gas Association: Chairman of Rehabilitation and Repair of Gas Pipes

PUBLICATIONS:

Total number of published papers is 405 and 6 books are co-authored. The following is the list of papers published in Journals with reviews (1997-2008):

- 1) Isao Tukiya, Tadanobu Sato, Hitoshi Furuta and Mayuko Mori: Development of Decision Support System for Restriction of Water Supply after Large-Scale disasters, Journal of Japanese Society of Natural Disaster Science, Vol.26, No.4, 367-377, 2008
- 2) Jian Zhang, Tadanobu Sato and Susum Iai: Novel Support Vector Regression for Structural System Identification, Structural Control and Health Monitoring, 14:609-626, 2008.
- 3) Jian Zhang, Tadanobu Sato, Susum Iai and Tara Hutchinson, A pattern recognition technique for structural identification using observed vibration signals: linear case studies, Engineering Structures, 30(5), 1439-1446, 2008.
- 4) Jian Zhang, Tadanobu Sato, Susum Iai and Tara Hutchinson, A pattern recognition technique for structural identification using observed vibration signals: nonlinear case studies. Engineering Structures, 30(5), 1417-1423, 2008.
- 5) Yuan Di, Jun Yang and Tadanobu Sato: An operator AKE model for large deformation analysis of geomaterials, International Journal for Numerical and Analytical methods in Geomechanics, 31, 1375-1399, 2007
- 6) Jian Zhang, Tadanobu Sato and Susum Iai: Support Vector Regression for Structural Identification via Component-Mode Synthesis. Structural Engineering and Mechanics, Vol. 25, No.5, 631-634, 2007
- 7) Jian Zhang, Tadanobu Sato and Susum Iai: Non-linear system identification of the versatile-typed structures by a novel signal processing technique, Earthquake Engineering & Structural Dynamics, 36:909-925, 2007.
- 8) Jian Zhang, Tadanobu sato and Susum Iai: Novel Support Vector Regression for Structural System Identification, Structural Control and Health Monitoring, 14, 609-636, 2007.
- 9) Tadanobu Sato: Topics to define seismic design earthquake motions, Tsuchi-to-Kiso, Japan Society of Geotechnical Engineering, 55(2), pp.18-21, 2007.
- 10) Masahiro Shinoda, Tadanobu Sato and Yoyoji Yonezawa: Effective calculation of limit state exceed ANCE

probability of earth slopes potentially having multiple critical slip surfaces, *Journal of Japan Society of Civil Engineers, C*, Vol.63, No.1, pp22-32, 2007.

- 11) Jian Zhang and Tadanobu Sato: Non-linear hysteretic structural identification by utilizing online support vector regression, *Proceedings of Structural Mechanics and Earthquake Engineering*, Vol.62, No.2, pp.312-322, 2006.
- 12) Jian Zhang, Tadanobu Sato and Susum Iai: Large-Scale Structural health Monitoring by Increment Support Vector Regression with Local Strategy, *Journal of Structural Safety*, Vol.28, pp.392-406, 2006.
- 13) Tadanobu Sato and Takaki Matumaru: Numerical simulation of liquefaction and flow process using mesh free method, *Journal of Japan Society of Civil Engineers, C*, Vol.62, No.1, pp.22-32, 2006.
- 14) Tadanobu Sato and Youhei Tanaka: Efficient system identification algorithm using Monte Carlo Filter and its application, *Proceedings of Structural Mechanics and Earthquake Engineering, JSCE, A*, Vol.62, No.3, pp.693-701, 2006
- 15) Tadanobu Sato and Youhei Tanaka: Detection of minor structural damage using Chaotic excitation and attractor-based damage indicator, *Proceedings of Structural Mechanics and Earthquake Engineering, JSCE, A*, Vol.62, no.4, pp.312-322, 2006.
- 16) Tadanobu Sato, Ikumasa Yoshida, Midori Masumoto and Hidesada Kanaji: Prioritization of seismic retrofit for road bridges based on the concept of life cycle cost, *Journal of Japan Society of Civil engineers*, No.784/VI-66, pp125-148, 2005.
- 17) Ikumasa Yoshida and Tadanobu Sato: Effective estimation method of low failure probability by using Markov Chain Monte Carlo, *Proceedings of Structural Mechanics and Earthquake Engineering, JSCE*, No.794/I-72, pp43-53, 2005.
- 18) Ikumasa Yoshida and Tadanobu Sato: A fragility analysis by low discrepancy sequence, *Proceedings of Structural Engineering*, Vol.51A, pp.351-356, 2005.
- 19) Tadanobu Sato, Yoshihei Horie, Midori Masumoto and Ikumasa Yoshida: Estimation of fragility curve for steel pier of bridge by using limit seismic intensity, *Proceedings of Structural Engineering*, Vol.51A, pp.529-536, 2005.
- 20) Ikumasa Yoshida and Tadanobu Sato: Damage detection by adaptive Monte Carlo filter, *Proceedings of Structural Mechanics and Earthquake Engineering, JSCE*, No.759/I-67, pp259-269, 2004.
- 21) Tadanobu SATO, Yoshitaka MURONO : Simulation of Non-Stationary Earthquake Motion Based on Phase Information, *Journal of Structural Mechanics and Earthquake Engineering*, Vol.I-66, No.752, pp.159~ pp.168, 2004.1
- 22) Mituo Kunichika and Tadanobu Sato: Evaluation of seismic capacities of divisional shafts with different assembly methods, *Journal of Japan society of Natural disaster Science*, 25-3, pp.391-403, 2004.
- 23) Mituo Kunichika and Tadanobu Sato: An earthquake resistant design methodology for divisional shaft based on the response displacement method, *Journal of Japan society of Natural disaster Science*, 23-3, pp.381-390, 2004
- 24) Yuan Di, Tadanobu Sato: A practical numerical method for large strain liquefaction analysis of saturated soils, *Soil Dynamics and Earthquake Engineering*, Vol.24, pp.251~ pp.260, 2004.
- 25) Abraham I. Beltzer, Tadanobu Sato : Neural classification of finite elements, *Computers & Structures*, No.81, pp.2331~ pp.2335, 2003.7
- 26) Abraham I. Beltzer, Tadanobu Sato: Probability distribution of wave velocity in heterogeneous media due to random phase configuration, *Elsevier, Wave Motion*, science direct, 2003.3
- 27) Masayuki Kohiyama, Norihiko Yamashita, Tadanobu Sato, Lu Hengjian, Norio Maki, Satoshi Tanaka: Expansion of the Nishinomiya Built Environment Database-Simulation of seismic ground motion distribution and correlation with damage in the 1995 Hyogo-ken Nanbu Earthquake, *Natural Hazards*, No.29, pp.501~ pp.522, 2003.
- 28) Yuan Di, Tadanobu Sato: Liquefaction analysis of saturated soils taking into account variation in porosity and

permeability with large deformation, *Computers and Geotechnics*, Vol.30, pp.623~ pp.635, 2003.

- 29) T. Sato, Y. Moon, R. Uzuoka: Unified Analysis of Liquefaction and Flow Processes of Inclined Ground Using Fluidal Elasto-Plastic Model, *Journal of Structural Mechanics and Earthquake Engineering*, Vol.III-61, No.722, pp.109~ pp.119, 2002.12
- 30) T. Sato, Y. Moon, R. Uzuoka: Fluidal-Elasto-Plastic Constitutive Equation of Sand and Unified Analyses of Liquefaction and Flow Processes of Ground, *Journal of Structural Mechanics and Earthquake Engineering*, Vol.717, No.I-61, pp.53~ pp.64, 2002.10
- 31) Tadanobu SATO, Yoshitaka MURONO, Tomohiro KAWANISHI: Interpolation of Earthquake Motions Using Observed Phase Spectra Case Studies for the CHI-CHI Earthquake(1999), *Journal of Structural Mechanics and Earthquake Engineering*, Vol. I -60, No.710, pp.225~ pp.234, 2002.7
- 32) T. Okimura, T. Sato, M. Nambu, A. Wakabayashi, H. Kishimoto: Seismic Frequency Analysis with Geological Information Database in Kobe District, *Journal of Structural Mechanics and Earthquake Engineering*, No.701, pp.121~ pp.134, 2002.3
- 33) J.Yang, T.Sato, S.Savidis, X.S.Li: Horizontal and vertical components of earthquake ground motions at liquefiable sites, *Soil Dynamics and Earthquake Engineering*, No.22, pp.229~ pp.240, 2002.
- 34) Ikumasa YOSHIDA, Tadanobu SATO: Health Monitoring Algorithm by the Monte Carlo Filter Based on Non-Gaussian Noise, *Journal of Natural Disaster Science*, Vol.24, No.2, pp.101~ pp.107, 2002.
- 35) Tadanobu SATO, Yoshitaka MURONO, Akihiko NISHIMURA: Phase Spectrum Modeling to Simulate Design Earthquake Motion, *Journal of Natural Disaster Science*, Vol.24, No.2, pp.91~ pp.100, 2002.
- 36) Tadanobu SATO and Yoshitaka MURONO: Simulation of Earthquake Motion using Phase Information of Earthquake Motion, *Journal of Structural Mechanics and Earthquake Engineering, JSCE*, Vol.I-55, No.675, pp.113-123, 2001.
- 37) Tadanobu SATO and Keisuke KAJI: Structural Identification using the Monte Carlo Filter, *Journal of Structural Mechanics and Earthquake Engineering, JSCE*, Vol.I-55, No.675, pp.161-170, 2001.
- 38) Victor A. Gotlib, Tadanobu SATO and Abraham I. Beltzer: Neural Computation of Effective Properties of Random Composite Materials, *Computers and Structures*, No.79, pp.1-6, 2001.
- 39) Jun YANG and Tadanobu SATO : Analytical Study of Saturation Effects on Seismic Vertical Amplification of a Soil Layer, *Geotechnique*, Vol.51, No.2, pp.161-165,2001.
- 40) Tadanobu SATO and Satoru TANAKA: Real-Time Hybrid Experiment of Structural control by Variable Damper, *Journal of Structural Mechanics and Earthquake Engineering, JSCE*, Vol.I-51, No.647, pp.425-433, 2000.
- 41) Tadanobu SATO and Keisuke KAJI : Linear Algorithm to Identify Nonlinear Structural System, *Journal of Structural Mechanics and Earthquake Engineering, JSCE*, Vol.I-51, No.647, pp.155-165, 2000.
- 42) Jun YANG and Tadanobu SATO: Computation of Individual Contribution of Two compression Waves in Vibration of Water-saturated Soils, *Computers and Geotechnics*, No.27, pp.79-100, 2000.
- 43) Jun YANG and Tadanobu SATO: Influence of Water Saturation on Horizontal and Vertical Motion at a Porous Soil Interface Induced by Incident SV waves, *Soil Dynamics and Earthquake Engineering*, No.19, pp.339-346, 2000.
- 44) Jun YANG, Tadanobu SATO and Xiang-Song Li: Nonlinear site effects on strong ground motion at a reclaimed island, *Canadian Geotechnical Journal*, Vol.37, pp.26-39, 2000.
- 45) Jun YANG and Tadanobu SATO : Interpretation of Seismic Vertical Amplification Observed at an Array Site, *Bulletin of the Seismological Society of America*, Vol.90, No.2, pp.275-285, 2000.
- 46) Tadanobu SATO, Yoshitaka MURONO and Akihiko NISHIMURA : Empirical Modeling of Phase Spectrum of Earthquake Motion, *Journal of Structural Mechanics and Earthquake Engineering, JSCE*, Vol.I-50, No.640, pp.119-130, 2000.
- 47) Victor A. Gotlib, Tadanobu Sato and Abraham I. Beltzer: Neural computation of effective response of random

composites, International Journal Solids and Structures, Vol.37, pp.4527-4538, 2000.

- 48) Tadanobu SATO and Hirofumi IMABAYASHI: Real Time Conditional Simulation of Earthquake Ground Motion, Earthquake Engineering and Engineering Seismology, Vol.1, No.1, pp27-38, 1999.
- 49) Tadanobu SATO, Yoshitaka MURONO and Akihiko NISHIMURA: Modeling Phase Characteristics of Strong Earthquake Motion, Journal of Structural Mechanics and Earthquake Engineering, JSCE, Vol.I-46, No.612, pp.201-213, 1999.
- 50) Tadanobu SATO and Kai QI : Adaptive H^∞ Filter: Its Application to Structural Identification, ASCE Journal of Engineering Mechanics, Vol.124, No.11, pp.1233-1240, 1998.
- 51) Jun YANG and Tadanobu SATO: Influence of Viscous Coupling on Seismic Reflection and Transmission in Saturated Porous Media, Bulletin of the Seismological Society of America, Vol.88, No.5, pp.1289-1299, 1998.
- 52) Jun YANG and Tadanobu SATO : Dynamic Response of Saturated Layered Half-Space with Different Hydraulic Interface Conditions, Archive of Applied Mechanics, Vol.68, No.8, pp.677-688, 1998
- 53) Tadanobu SATO and Kai QI : Structural System Identification Using the H^∞ Filter, Journal of Structural Engineering and Earthquake Engineering, JSCE, Vol.15, No.1, pp.73-84, 1998
- 54) Jun YANG and Tadanobu SATO: On the Vibration of Layered Saturated Half-Space under Low Frequency Excitation, Journal of Sound and Vibration, Vol.213, No.5, pp.561-568, 1998.
- 55) Tadanobu SATO, Kiril HADJIYSKI, Satoru TANAKA and Kenzo TOKI : Hybrid Simulation of Structural Control with a Variable Damper, Journal of Natural Disaster Science, Vol.19, No.2, pp.119-132, 1997
- 56) Tadanobu SATO and Makoto SATO : Structural Identification Using Neural Network and Kalman Filter Algorithms, Journal of Structural Mechanics and Earthquake Engineering, Vol.I-39, No.563, pp.23-32, 1997
- 57) Tadanobu SATO, Katsutoshi KITA and Tomonari MAEDA : Estimation of Response Spectra in the Severely Damaged Area during the 1995 Hyogo-Ken Nambu Earthquake, Earthquake and Atmospheric Hazards, Journal of Natural Hazards, Vol.16, pp.203-218, 1997.