



Masato R. Nakamura, Eng.Sc.D.

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EDUCATION

Columbia University, New York, NY

Doctor of Engineering Science (Eng.Sc.D), Earth and Environmental Engineering,
Stochastic simulation and integrated modeling of waste-to-energy (WTE) technology.
Quantitative analysis of renewable energy and sustainable development.

May 2008

Hokkaido University, Sapporo, Japan

Master of Engineering, Materials Science and Engineering,

March 1998

Numerical analysis of diffusion and electrical activation of impurities and point defects in semiconductors.

Bachelor of Engineering, Metallurgical Engineering,

March 1996

Developed a diffusion model using Fortran in order to solve partial differential equations (PDEs) and rate equations.

Asahikawa National College of Technology, Asahikawa, Japan

Associate of Engineering, Electrical Engineering,

March 1992

PROFESSIONAL EXPERIENCE

Combustion and Catalysis Lab, Department of Earth and Environmental Engineering, Columbia University, New York, NY

Postdoctoral Research Scientist,

September 2010 - present

Design (CAD/CAM) and Analysis Project

- Designed reactors for gasification of solid waste using Computer Aided Design (CAD) software (SolidWorks) and Computational Fluid Dynamics (CFD) software (ANSYS/FLUENT).
- Designed combustion chambers and travelling grate systems for low emissions.
- Analyzed transport phenomena (heat transfer) in Data Centers for high energy efficiency.

Earth Engineering Center (EEC), Columbia University, New York, NY

Research Associate,

May 2008 – August 2010

Solid Waste Modeling Project

- Developed a 2-dimensional stochastic model of MSW on the reverse acting grate of a combustion chamber.
- Integrated the stochastic model with a combustion model.

Next Generation Combustion Chamber Design Project

- Designed a “semi-fluidized bed” controlling size segregation phenomena and applied for reducing maintenance cost.

Quantitative Research Laboratory, ITOCHU Technology, Inc. (ITI), New York, NY

Solutions Architect and Engineer,

April 2008 - March 2010

Financial Engineering and IT Solution Projects

- Developed algorithmic trading strategies, including quantitative research (strategy design), analytic prototyping, and application development, based on marketing and academic research.
- Organized and operated training seminar series on financial engineering and stochastic simulation to customers including quantitative analysts, traders, and systems engineers.
- Assisted senior systems engineers who work at commercial banks.

Green Technology Project

- Involved and participated in evaluation process of vender’s technologies, especially from the aspect of environmental engineering, or green IT/computing.
- Researched energy efficiency in Green Data Centers.

Earth Engineering Center (EEC), Columbia University, New York, NY

Jr Research Associate,

January 2004 – April 2008

- Analyzed transport and mixing phenomena in a combustion chamber using MATLAB programming.
- Participated and supported research activities of WTERT members maintaining and operating a waste-to-energy (WTE) reference database system (SOFOS).

Research Assistant,

September – December 2003

- Quantitative simulation of Municipal Solid Waste Processing.
- Contributed founding and managing the Waste-To-Energy Research and Technology (WTERT) Council.

CAC Co. at RECRUIT Co., Ltd, Tokyo, Japan

Systems Engineer of Database servers,

January - August 2001

- Coded for efficient transaction of time series events.
- Operated and managed Oracle database servers.
- Created and updated shell scripts.

Mitsubishi Space Software Co., Ltd at Japan Marine Science and Technology Center (JAMSTEC), Yokosuka, Japan

Systems Engineer of Unix & Vax servers,

April 1999 – December 2000

- Consulted and supported marine researchers.
- Contributed scientific computing and programming (CFD, Matlab).
- Operated calculation servers and mail & www servers.
- Managed networking (including Cisco Routing and Switching).

HONORS AND AWARDS

Winner of Solid Waste Processing Division, American Society of Mechanical Engineers (ASME) Program Award, New York, NY,

September 2003- May 2004

Research Assistant's Program, Earth Institute, Columbia University, New York, NY,

January - May 2003

Department of Earth and Environmental Engineering (DEEE) Fellowship, Columbia University, New York, NY,

January 2002 – May 2008

TEACHING EXPERIENCE

Department of Mechanical Engineering Technology, New York City College of Technology, City University of New York (CUNY), New York, NY

Adjunct,

January 2011 – present

Coursework in spring semester 2011

- Industrial Design Technology: Advanced Solid Modeling II (lecture and computer lab)
- Mechanical Engineering Technology: Computer-Aided Manufacturing Systems (lecture and computer lab)

Quantitative Analysis Group, New York Branch, Bank of Tokyo-Mitsubishi UFJ, Ltd. (BTMU), New York, NY

Invited Lecturer in the training seminar,

November 2008

- Organized a training seminar and taught MATLAB programming for 6 financial mathematicians and engineers
- Trained MATLAB toolboxes (curb fitting, financial, and derivatives toolboxes)

School of Engineering and Applied Science (SEAS), and Graduate School of Architecture, Planning and Preservation (GSAPP), Columbia University, New York, NY

Teaching Assistant (TA) in E4260 Urban Ecology Studio (graduate course),

September - December 2005

Supervisors: Professors Nickolas Themelis and Phil Simmons, Laurie Hawkinson and Kate Orff

SKILLS

C/C++, Matlab, VBA, Java, Fortran, Mathematica, awk, Oracle, Perl, Unix, Linux, Open VMS (VAX), Cisco Routing and Switching.

PROFESSIONAL AFFILIATION

American Physical Society (APS)

American Society of Mechanical Engineers (ASME)

American Institute of Chemical Engineers (AIChE)

Japan Society of Waste Management Experts (JSWME)

International Association of Engineers (IAENG)

International Association of Financial Engineers (IAFE)

PUBLICATIONS: (*Peer reviewed)

* M.R. Nakamura, M.J. Castaldi, and N.J. Themelis, "Stochastic and physical modeling of motion of municipal solid waste (MSW) particles on a waste-to-energy (WTE) moving grate," International Journal of Thermal Sciences Volume 49, Issue 6, 984-992 (2010)

* M.R. Nakamura, M.J. Castaldi, and N.J. Themelis, " Quantitative Analysis of the Flow, Mixing, and Size Segregation Phenomena of Municipal Solid Waste Particles on Traveling Grate of Waste-to-Energy (WTE) Combustion Chamber," Proceedings of the 17th Annual North American Waste-to-Energy Conference (NAWTEC17), Chantilly, Virginia (2009)

* M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Numerical Analysis of size reduction of municipal solid waste particles on the traveling grate in a waste-to-energy combustion chamber," Proc. 14th annual North American Waste To Energy Conference (NAWTEC14), pp. 125-130, Tampa, FL (2006)

M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Measurement of Particle Size and Shape of New York City Municipal Solid Waste and Combustion Residues Using Image Analysis," Proc. 16th Japan Society of Waste Management Experts (JSMWE) Fall Conference, pp. 1-3, Sendai, Japan (2005)

M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Markov Chain Simulation of Solid Waste Fuel Flow and Mixing on the Reverse Acting Grate," Proc. 15th Japan Society of Waste Management Experts (JSMWE) Fall Conference, pp. 43-45, Takamatsu, Japan (2004)

* M. Nakamura, "Report on the 2003 Fall Meeting of Waste-to-Energy Research and Technology (WTERT) Council in New York City," (Written in Japanese) Waste Management Research Vol. 15, No. 4 pp. 213-215, JSMWE (2004)

* M. Nakamura, and N. J. Themelis, "Modeling of Solid Waste Flow and Mixing on the Traveling Grate of Waste-to-energy Combustion Chambers," Proc. 12th annual North American Waste To Energy Conference (NAWTEC12) pp. 273-282, Savannah, GA (2004)

* M. Nakamura, H. Zhang, K. Millrath, and N. J. Themelis, "Modeling of Waste-to-Energy Combustion with

Continuous Variation of the Solid Waste Fuel," 2003 ASME ICMEE, Washington, D.C. (2003)

M. Nakamura, N. Sakaguchi, S. Watanabe, and H. Takahashi, "Excess Defect Diffusion during Annealing in Ion-Implanted Semiconductor," International Symposium for Advanced Research of Energy Technology, Sapporo, Japan (1998)

* S. Watanabe, N. Sakaguchi, K. Kurome, M. Nakamura, and H. Takahashi, "On the Mechanism of Radiation-induced Segregation," Journal of Nuclear Materials, 240. pp. 251-253 (1997)

* S. Watanabe, N. Sakaguchi, N. Hashimoto, M. Nakamura, H. Takahashi, C. Nambe and N. Q. Lam, "Radiation-induced Segregation Accompanied by Grain Boundary Migration in Austenitic Stainless Steel," Journal of Nuclear Materials, 232. pp. 113-118 (1996)

PROFESSIONAL ORAL AND POSTER PRESENTATIONS: (*Oral presentation)

M.R. Nakamura, M.J. Castaldi, and N.J. Themelis, " Numerical Analysis of Flow and Mixing Phenomena of Municipal Solid Waste Particles on a Reverse Acting Grate," poster presentation at Waste-To-Energy Research Technology (WTERT) Council Fall Meeting of 2010, New York, NY. (2010)

* M.R. Nakamura, M.J. Castaldi, and N.J. Themelis, " Quantitative Analysis of the Flow, Mixing, and Size Segregation Phenomena of Municipal Solid Waste Particles on Traveling Grate of Waste-to-Energy (WTE) Combustion Chamber," oral presentation at the 17th Annual North American Waste-to-Energy Conference (NAWTEC17), Chantilly, Virginia (2009)

* M.R. Nakamura, M.J. Castaldi, and N.J. Themelis, "Computational and experimental studies of the flow, mixing, size segregation phenomena of heterogeneous granular materials," oral presentation at the 61st Annual Meeting of the American Physical Society (APS) Division of Fluid Dynamic (DFD) San Antonio, Texas, (2008)

M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Physical and Stochastic Modeling of Mixing Phenomena of Municipal Solid Waste (MSW) Particles on a Traveling Grate," poster presentation at Waste-To-Energy Research Technology (WTERT) Council Fall Meeting of 2006, New York, NY. (2006)

* M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Numerical Analysis of size reduction of municipal solid waste particles on the traveling grate in a waste-to-energy combustion chamber," oral presentation at 14th annual North American Waste To Energy Conference (NAWTEC14), Tampa, FL (2006)

M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Measurement of Particle Size and Shape of New York City Municipal Solid Waste and Combustion Residues Using Image Analysis," poster presentation at 16th Japan Society of Waste Management Experts (JSMWE) Fall Conference, Sendai, Japan (2005)

M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Transport and Reaction Phenomena of Municipal Solid Waste (MSW) on WTE Grates," poster presentation at Waste-To-Energy Research Technology (WTERT) Council Fall Meeting of 2005, New York, NY. (2005)

M. Nakamura, M.J. Castaldi, and N.J. Themelis, "Markov Chain Simulation of Solid Waste Fuel Flow and Mixing on the Reverse Acting Grate," poster presentation at 15th Japan Society of Waste Management Experts (JSMWE) Fall Conference, Takamatsu, Japan (2004)

* M. Nakamura, "Stochastic Simulation of MSW Flow and Mixing on WTE Grates," oral presentation at Waste-To-Energy Research Technology (WTERT) Council Fall Meeting of 2004, New York, NY. (2004)

M. Nakamura, L. El-Youssef, M. J. Castaldi, and N. J. Themelis, "Size and Shape Analysis of Particles of Municipal Solid Wastes and Waste-To-Energy Combustion Residues," poster presentation at Waste-To-Energy Research Technology (WTERT) Council Fall Meeting of 2004, New York, NY. (2004)

* M. Nakamura, "Modeling of Solid Waste Flow and Mixing on the Traveling Grate of Waste-to-energy Combustion Chambers," oral presentation at 12th annual North American Waste To Energy Conference (NAWTEC 12), Savannah, GA. (2004)

* M. Nakamura, "Modeling of Waste-to-Energy Combustion with Continuous Variation of the Solid Waste Fuel," oral presentation at the 2003 ASME ICMEE, Washington, D.C. (2003)

* M. Nakamura, "Simulation of Solid Waste Components and Combustion Processes in a WTE incinerator," oral presentation at the International Symposium for Advanced Research of Energy Technology, Sapporo, Japan (2003)

* M. Nakamura, "Excess Defect Diffusion during Annealing in Ion-Implanted Semiconductor," oral presentation at the International Symposium for Advanced Research of Energy Technology, Sapporo, Japan (1998)

M. Nakamura, "Computer Simulation of Diffusion and Electrical Activation of Impurity and Point Defects in Crystalline Silicon," poster presentation at the Gordon Research Conference on Materials Processes Far from Equilibrium, NH. (1997)

REFERENCES AVAILABLE UPON REQUEST

02/17/2011 updated