SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

AMM&NS programme

Non-collaborative Publications

Inter-University Project Title: Nanomechanics Ultra-Fine-Scale Structures and Living Cells

AY 2005/2006

Conference Publications

1. Lim C. T., "Biomechanical and microfluidic approaches to studying human diseases", School of Public Health, Harvard University, 2006. AND International Workshop on Lab-on-a-Chip: Modelling, Fabrication and Applications, Singapore, 2006.

2. Lim C. T., "Relevance of Mechanics to Studying Human Diseases", Indo-Singapore Symposium on Advanced Functional Materials, IIT (Bombay), India, 24-26 February 2006.

3. Mills J. P., Diez M., Lim C. T., Tan K. S. W. and Suresh S., "Influence of human disease states on single-cell and cell-population mechanics (Invited lecture)", Symposium on Physics and Mechanics of Advanced Materials, Singapore, 2006.

4. Lim C. T., "Connections between biomechanical states and the progression of a human diseased cell (Invited lecture)", National Tsing Hua University, Taiwan, 2005. AND Department of Biomedical Engineering, Columbia University, USA, 2005.

5. Lim C. T., "Nanomechanics of Biological Structures & Biomaterials (Invited lecture)", Institute of Microelectronics, Singapore, 2005.

6. Lim C. T., "Nanomechanical characterization of nanoscale biomaterials (Invited lecture)", Department of Materials Science & Engineering, Johns Hopkins University, USA, 2005.

7. Lim C. T., "Mechanically probing the molecular interaction and modification of Plasmodium falciparum harboring human red cell (Invited lecture)", National Institute of Allergies & Infectious Diseases. NIH, USA, 2005.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CSB programme

Non-collaborative publications

Flagship Research Project Title: Tissue Systems Biology

AY 2005/2006

Journal Publications

1. Balakrishnan K., Har J. Y., Liu P., Maruyama I., Ding J. L. & Thorsten W., "EMCCD-camera based fluorescence correlation spectroscopy", Analytical Chemistry, 2006 (in press).

2. Dao M., Li J. & Suresh S., "Molecularly based analysis of deformation of spectrin network and human erythrocyte", Materials Science and Engineering C, Vol. 26, pp. 1232-1244, 26 January 2006.

3. Suresh S., "Mechanical Response of Human Red Blood Cells in health and Disease: Some Structure-Property-Function Relationships", Journal of Materials Research, Vol. 21, No. 8, pp. 1871-1877, August 2006.

Conference Publications

1. Ding J. L., Ng M. L., Saux A. L., Diana L. H. P., Naxin J. & Ho B., "Frontline innate immune lectin-code for host-pathogen interaction", 4th International Innate Immunity Conference, Aegean Conferences, Corfu, Greece, 4-9 June 2006.

2. Dao M., Li J. & Suresh S., "Experimental and Computational mechanics of Biological Cells and Molecules", TMS Annual Meeting, San Antonio, Texas, 12-16 March 2006.

3. Suresh S., Mills J. P. & Dao M., "Cell Mechanics and Human Diseases", Materials Research Society Annual Meeting, Boston, MA, USA, 28 November – 2 December 2005.

Inter-University Project Title: Advanced Computational Image Analysis

Journal Publications

1. Duan K. B., Rajapakse J. C., Wang H. & Azuaje F., "Multiple SVM-RFE for gene selection in cancer classification with expression data", IEEE Transactions on Nanobioscience, Vol. 4, No. 3, pp. 228-234, September 2005.

2. Tsybakov A., "Aggregation of density estimators and dimension reduction", to appear in the Festschrift in Honor of K. Doksum 65th birthday, V. Nair (ed.), 2006 (available also at https://hal.ccsd.cnrs.fr/ccsd-00014122).

3. Amato U., Antoniadis A. & Tsybakov A., "Kernel-based classification and noisy ICA models for dimensionality reduction", in progress.

4. Zheng Y. & Rajapakse J. C. (eds.), "Machine Learning in Bioinformatics", John Wiley and Sons, to be published in early 2007.

5. McCann L. & Welsch R. E., "Robust Variable Selection Using Least Angle Regression and Elemental Set Sampling", submitted to Journal of computational Statistics and Data Analysis 2006.

Conference Publication

Welsch R., "Simultaneous Robust Estimation and Variable Selection", at the Third IASC World Conference on Computational Statistics and Data Analysis, Limassol, Cyprus, 28-31 October 2005.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CE programme

Collaborative Publications with SMA-MIT Fellows

Flagship Research Project Title: Design-Simulate-Fabricate Micro-/Nano-fluidics for Cell and Biomolecule Manipulation

AY 2005/2006

Journal Publication

Le D. V., Khoo B. C. & Peraire J., "An immersed interface method for viscous incompressible flows involving rigid and flexible boundaries", Journal of Computational Physics, 2006 (In Press).

Conference Publications

1. Nguyen V. T., Khoo B. C., Persson P. O. & Peraire J., "Shock Capturing for High Order Discontinuous Galekin Methods", 7th World Congress on Computational Mechanics, July 2006.

2. Nguyen V. T., Khoo B. C. & Peraire J., "A Conservative Front Tracking Algorithm", The 6th Singapore-MIT Alliance (SMA) Symposium, Singapore, 19-20 January 2006.

Inter-University Project Title: Effective Computation: Reduced Order Models and Uncertainty Management in Numerical Simulations

Journal Publications

1. My-Ha D., Lim K. M., Khoo B. C. & Willcox K., "Real-Time Optimization Using Proper Orthogonal Decomposition: Free Surface Shape Prediction due to Underwater bubble Dynamics", Computers and Fluids, 2006 (accepted).

2. Sen S., Veroy K., Huynh D. B. P., Deparis S., Nguyen N. C. & Patera A. T., "'Natural Norm' A Posteriori Error Estimators for Reduced Basis Approximations", Journal of Computational Physics, Vol. 217 (1), pp. 37-62, September 2006.

3. Xuan Z. C., Pares N. & Peraire J., "Computing Upper and Lower Bounds for the Jiintegral in Two-Dimensional Linear Elasticity", Comp. Meth in Applied Mech and Engnrn, Vol.195 (4-6), pp. 430-443, 15 January 2006.

Conference Publication

Huynh D. B. P., Peraire J., Patera A. T. & Liu G. R., "Real-Time Reliable Prediction of Linear-Elastic Mode-I Stress Intensity Factors for Failure Analysis", SMA Symposium 2006.

Inter-University Project Title: Robust Optimization: A tractable approach to address optimization and equilibrium problems under uncertainty

Journal Publications

1. Bertsimas D. & Natarajan K., "A Semidefinite Approach to the Steady-State Analysis of Queueing Systems", Submitted to Queueing Systems (2006).

2. Bertsimas D., Natarajan K. & Teo C. P., "Tight Bounds on Expected Order Statistics", to appear in Probability in Engineering and Informational Sciences (2005).

3. Bertsimas D. & Sim M., "Tractable Approximations to Robust conic Optimization Problems", Mathematical Programming: Series A & B, Vol. 107 (1), pp. 5-36, June 2006.

4. Bertsimas D. & Sim M., "Robust Discrete Optimization and Downside Risk Measures', Under review in Operations Research (2005).

5. Chen X., Sim M., Sun P. & Simchi-Levi D., "Risk Aversion in Inventory Management", Under review in Operations Research (2005).

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CE programme

Non-collaborative Publications

Flagship Research Project Title: Design-Simulate-Fabricate Micro-/Nano-fluidics for Cell and Biomolecule Manipulation

AY 2005/2006

Journal Publications

1. Liu M. B. & Liu G. R., "Restoring particle consistency in smoothed particle hydrodynamics", Applied Numerical Mathematics, Vol. 56 (1), pp. 19-36, January 2006.

2. Radjiman S., Han L. Y., Wang J. S. & Chen Y. Z., "Super paramagnetic clustering of DNA sequences", Journal of Biological Physics, Vol. 32, pp. 11-25, January 2006.

3. Han L. Y., Lin H. H., Li Z. R., Zheng C. J., Cao Z. W., Xie B. Z. & Chen Y. Z., "PEARLS: Program for energetic analysis of receptor-ligand system", Journal of Chemical Information and Modelling, Vol. 46, pp. 445-450, January 2006.

4. Wang X., Kanapka J., Ye W., Aluru N. & White J., "Algorithms in FastStokes and its application to micromachined device simulation", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems", Vol. 25, February 2006.

5. Altman M. D., Bardhan J., Tidor B. & White J., "FFTSVD: A Fast Multiscale Boundary Element Method Solver Suitable for BioMEMS and Biomolecule Simulation", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems", Vol. 25, February 2006.

6. Vasilyey D., Rewienski M. & White J., "Macromodel generation for BioMEMS components using a stabilized Balanced Truncation plus Trajectory Piecewise Linear Approach", IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems", Vol. 25, February 2006.

7. Fu J. P., Yoo J. W. & Han J. Y., "Molecular sieving in periodic free-energy landscapes created by patterned nanofilter arrays", Physical Review Letters, Accepted for publication on June 2006 (in print).

8. Fu J. P., Pan M. & Han J. Y., "A Nanofilter Array Chip for Fast Gel-Free Biomolecule Separation", Applied Physics Letters, Vol. 87, pp. 263902, December 2005.

9. Taff B. M. & Voldman J., "A Scalable Addressable Positive-Dielectrophoretic Cell-Sorting Array', Analytical Chemistry, Vol. 77, pp. 7976-7983, 2005.

Conference Publications

1. Wang S. Y., Lim K. M., Khoo B. C. & Lim S. P., "Shape and Topology Optimization Using a Level Set Model", 7th World Congress on Computational Mechanics, July 2006.

2. Lim K. M., He X. F. & Lim S. P., "Fast Fourier transform on multipoles algorithm with accelerated volume integration for 3D Poisson equation", 7th World Congress on Computational Mechanics, July 2006.

3. Kuo S. & White J., "A Nystrom-Like Approach to Integral Equations with Singular Kernels", International Conference on Modeling and Simulation of Microsystems, May 2006.

4. Fu J. P. & Han J. Y., "Separation of Biomolecule in patterned Nanofluidic Sieving Medium", 2006 APS (American Physical Society) March Meeting, Baltimore, MD, March 2006 (no proceedings).

5. Altman M., Bardhan J., White J. & Tidor B., "An Accurate Surface Formulation for Biomolecule Electrostatics in Non-Ionic Solutions", 27th Annual International Conference of the Engineering in Medicine and Biology Society", September 2005.

6. Vasilyey D. & White J., "A more reliable reduction algorithm for behavioral model extraction", IEEE Conference on Computer-Aided Design, November 2005.

7. He X. F., Lim K. M. & Lim S. P., "Fast Fourier Transform on Multipoles (FFTM) Algorithm for Laplace Equation with Neumann Boundary Condition", The 2nd International Conference on Scientific Computing and Partial Differential Equations, December 2005.

8. Nyugen N. S., Lim K. M. & White J., "A Precorrected-FFT Method for Coupled Electrostatic-Stokes Flow Problem", The 2nd International Conference on Scientific Computing and Partial Differential Equations, December 2005.

9. Fu J. P. & Han J. Y., "A nanofilter array chip for fast gel-free biomolecule separation", Proceedings of Micro TAS 2005, Boston MA, USA, October 2005 (Vol. 2, pp. 1531).

10. Taff B. M. & Voldman J., "Efficiently Addressable Dielectrophoretic Bioparticle Traps", Biomedical Engineering society Annual Meeting, Baltimore, MD, Fall 2005.

11. Taff B. & Voldman J., "A scalable row/column-addressable dielectrophoretic cell-trapping array", Micro Total Analysis Systems '05, Boston MA, USA, Fall 2005 (Edited by Han J, Harrison D, Jensen KF, Voldman J: Transducers Research Foundation: 2005, 865-867).

Inter-University Project Title: Effective Computation: Reduced Order Models and Uncertainty Management in Numerical Simulations

Journal Publications

1. Strang G., "Maximum flows and Minimum Cuts in the Plane', Journal of Global Optimization, 2006 (accepted).

2. Strang G., "Maximum Area With New Measures of Perimeter", to appear

3. Willcox K., Bui-Thanh T., Ghattas O. & Waanders B. van B., "Goal-Oriented Optimization Framework for Model Reduction of Large-scale Systems", to appear

4. Pares N., Bonet J., Huerta A. & Peraire J., "The computation of bounds for linear-functional outputs of weak solutions to the two-dimensional elasticity equations", Comp. Meth in Applied Mech and Engnrn, Vol. 195, 2006.

Inter-University Project Title: Advanced Optimization Methods: Theory and Computation for Emerging Applications

Journal Publications

1. Chai J. C. & Toh K. C., "Computation of condition numbers for linear programming problems using Pena's method", Optimization Methods and Software, Vol. 21, pp. 419-443, 2006.

2. Zhou G. L. & Toh K. C., "Superlinear convergence of a Newton-type algorithm for monotone equations", J. Optimization Theory and Applications, Vol, 125, pp. 205-221 (2005).

3. Cai Z. & Toh K. C., "Solving second order cone programming via the augmented systems", SIAM J. Optimization, accepted in March 2006.

4. Freund R. M., Ordonez F. & Toh K. C., "Behavioral measures and their correlation with IPM iteration counts on semi-definite programming problems", Mathematical Programming, accepted in February 2006.

5. Chai J. S. & Toh K. C., "Preconditioning and iterative solution of symmetric indefinite linear systems arising form interior point methods for linear programming", submitted.

6. Toh K. C. and Phoon K. K., "Further observations on generalized Jacobi preconditioning for iterative solution of Biot's FEM equations", submitted.

7. Sun D., Sun J. & Zhang L., "The Rate of Convergence of the Augmented Lagrangian Method for Nonlinear Semidefinite Programming", Submitted.

8. Pang J. S. and Sun J., "Nash-Cournot Equilibria with Piecewise Quadratic Costs", to appear in Pacific Journal of Optimization.

9. Shu J. & Sun J., "The Stochastic Location-Inventory Network Design Model with Risk Pooling", Submitted.

10. Han D. & Sun J., "New Bounds for the Price of Anarchy under Nonlinear and Asymmetric Costs", Submitted.

Conference Publications

1. Chai J. S. & Toh K. C., "Preconditioning and iterative solution of symmetric indefinite linear systems arising form interior point methods for linear programming", Third Sino-Japanese Optimization Meeting, Singapore, 2005.

2. Toh K. C., "An SDP based approach for anchor free 3D graph localization", Third Sino-Japanese Optimization Meeting, Singapore, 2005.

3. Parrilo P. A., "Ordered quantum search via semidefinite programming", Workshop on Semidefinite Programming, IMS, Singapore, 2006.

4. Toh K. C., "A regularized SDP based approach for anchor free 3D graph localization", Workshop on Semidefinite Programming, IMS, Singapore, 2006.

Inter-University Project Title: Robust Optimization: A tractable approach to address optimization and equilibrium problems under uncertainty

Journal Publications

1. Ong C. J. & Gilbert E. G., "The Minimal Disturbance Invariant Set: Outer Approximations via Its Partial Sums", Accepted by Automatica (2005).

2. Natarajan K., Pachamanova D. & Sim M., "Constructing Risk Measures from Uncertainty Sets", Under review in Operations Research (2005).

3. Natarajan K., Pachamanova D. & Sim M., "A tractable Probabilistic Approach to Value-at-Risk Optimization", Under review in Management Sciences (2005).

4. Bertsimas D. & Brown D., "Constrained Stochastic LQC: A Tractable Approach", submitted to IEEE Journal of Automatic Control (2005).

5. Bertsimas D. & Brown D., "Robust Linear Optimization and Coherent Risk Measures", submitted to SIAM Journal of Optimization (2005).

6. Bertsimas D. & Thiele A., "A data driven approach to newsvendor problems", submitted to Operations Research (2005).

7. Adida E. & Perakis G., "A Robust Optimization Approach to Dynamic Pricing and Inventory Control with no Backorders", Mathematical Programming (2005).

8. Perakis G. & Roels G., "The "Price of Information"; Inventory Management with Limited Information about Demand", submitted to MSOM (2005).

9. Perakis G. & Roels G., "Regret in the Newsvendor Problem with Partial Information", submitted to Operations Research (2005).

10. Adida E. & Perakis G., "Nonlinear Fluid Model of Dynamic Pricing and Inventory control with no Backorders", submitted to Operations Research (2005).

11. Nguyen D. & Perakis G., "Robust Competitive Multi-period Pricing for Multiple Products with Fixed Capacity", submitted to Operations Research (2005).

12. Chen X., Sim M., Sun P. & Zhang J., "A tractable Approximation of Stochastic Programming via Robust Optimization", Under review in Operations Research (2006).

13. Chen X., Sim M. & Sun P., "A Robust Optimization Perspective of Stochastic Programming", Under review in Operations Research (2006).

14. Chou M., Sim M. & So K., "A Robust Optimization Framework for Analyzing Distribution Systems with Transshipment", Under review in Management Science (2006).

15. Bertsimas D. & Caramanis c., "Adaptive optimization I: finite adaptability", submitted to Operations Research (2006).

16. Bertsimas D. & Caramanis c., "Adaptive optimization via sampling", submitted to Mathematical Programming (2006).

17. Perakis G. & Sood A., "competitive Multi-period Pricing for Perishable Products: A Robust Optimization Approach", Mathematical Programming (2006).

18. Adida E. & Perakis G., "Dynamic Pricing and Inventory Control with no Backorders; Uncertainty and Competition", submitted to Mathematical Programming (2006).

Conference Publications

1. Sui D. & Ong C. J., "Multi-mode Model Predictive Controller for Constrained Linear Systems with Bounded Disturbances", Accepted by American Control Conference (2006).

2. Ong C. J. & Gilbert E., "Constrained Linear Systems with Disturbances: Enlargement of their Invariant Sets by Nonlinear Feedback", Accepted by American Control Conference (2006).

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

MST programme

Collaborative Publications with SMA-MIT Fellows

Inter-University Project Title: Dynamic Pricing and Revenue Mgmt for Air Cargo Transportation

AY 2005/2006

Conference Publications

Cheong M., Bhatnagar R. & Stephen C. G., "Pricing Model for Airfreight Business", to be presented at INFORMS International, Hong Kong, June 2006.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

MST programme

Non-collaborative Publications

Flagship Research Project Title: Manufacturing Processes, Equipment and Controls for the Production of Polymer-based Microfluidic Devices

AY 2005/2006

Journal Publications

1. Ames N. M. & Anand L., "On Modeling the micro-indentation response of an amorphous polymer", International Journal Of Plasticity, Vol. 22 (6), 2006.

2. Taylor H. K., Sun H., Hill T. F., Farahanchi A. & Boning D. S., "Characterizing and Predicting Spatial Non-uniformity in the Deep Reactive Ion Etching of silicon", Journal Of The Electrochemical Society, May 2006 (accepted).

3. Anand L., Gurtin M. E. & Lele S. P., "A one-dimensional theory of strain-gradient plasticity: Formulation, analysis, numerical results", Journal Of The Mechanics And Physics Of Solids, In Press (2006).

4. Shilpiekandula V. & Youcef-Toumi K., "Modeling and Control of a Programmable filter for Size-based Separations", ASME Journal of Dynamic Systems, Measurement and Control, In review (2006).

5. Gurtin M. E. & Anand L., "A theory of strain-gradient plasticity for isotropic, plastically irrotational materials. Part II: Finite deformations", International journal Of Plasticity, Vol. 21 (12), 2005.

6. Anand L. & Gurtin M. E., "The decomposition F=Fe-Fp, material symmetry, and plastic irrotationality for solids that are isotropic-viscoplastic or amorphous", Internatioal Journal Of Plasticity, Vol. 21 (9), 2005.

7. Gludlavalleti S., S., Gearing B. R. & Anand L., "Flexure-based micromechanical testing machines", Experimental Mechanics, Vol. 45 (5), 2005.

Conference Publications

1. Taylor H. K., Farahanchi A. & Boning D., "Tool- and pattern-dependent spatial variations in silicon deep reactive ion etch", International MEMS Conference '06 (iMEMS), May 2006.

2. Daniel J. B. & Youcef-Toumi K., "Shortening Carbon Nanotube-Tipped AFM Probes", 4th International Symposium on Nanomanufacturing, Cambridge, MA, to be presented November 2006.

3. Gutierrez M. R. & Youcef-Toumi K., "Programmable Separation for Biologically Active Molecules", ASME International Mechanical Engineering Congress and Exposition, to be presented November 2006.

4. Shilpiekandula V. & Youcef-Toumi K., "A Method for Maintaining Parallelism between Two Flat Surfaces", ASME International Mechanical Engineering Congress and Exposition, to be presented November 2006.

5. Daniel J. B. & Youcef-Toumi K., "On Single-Molecule DNA Sequencing with Functionalized Carbon", 4th IFAC Symposium on Mechatronic Systems, Heidelberg, Germany, to be presented September 2006.

6. Shilpiekandula V., Daniel J. B., El-Rifai K. & Youcef-Toumi K., "Metrology of Micro-embossed Devices: A Review", 1st International Conference on Micro-manufacturing, UIUC, IL, USA, to be presented September 2006.

7. Wang Q. & Hardt D. E., "Processing Window Identification and Process Variability Study of Micro Embossing", 1st International Conference on Micro-manufacturing, UIUC, IL, USA, to be presented September 2006.

8. Dirckx M. & Hardt D. E., "A Review of Hot Micro-Embossing Manufacturing Process Research", 1st International Conference on Micro-manufacturing, UIUC, IL, USA, to be presented September 2006.

9. Thaker K. & Hardt D. E., "A Functional Testing System for Process Characterization and Optimization of a Hot Micro-Embossing Machine", 1st International Conference on Micro-manufacturing, UIUC, IL, USA, to be presented September 2006.

10. Dirckx M. & Hardt D. E., "Tooling for Micro- and Nano-Imprinting and its Consequences for Manufacturing", 4th International Symposium on Nanomanufacturing, Cambridge, MA, to be presented November 2006.

11. Hardt D. E., Wang Q., Dirckx M., Shoji G. & Thaker K., "Process Control for Microembossing: Basic Characterization Studies", 4th International Symposium on Nanomanufacturing, Cambridge, MA, to be presented November 2005.

12. Gilbert J., Vollmer A., Thorsen T. A., Martin P. M., Dasse K. A., Snyder T. A., Borovetz H. S. & Monzyk B. F., "Microfluidic Artificial Respiratory Device Incorporating Photolytic auto-Oxygenation Of Whole Blood", Biomedical Engineering Society (BMES), 2005.

13. Shilpiekandula V. & Youcef-Toumi K., "Modeling and Control of a Programmable Filter for Biologically Active Molecules", American Control Conference, Portland, OR, June 2005.

Inter-University Project Title: Dynamic Pricing and Revenue Mgmt for Air Cargo Transportation

Journal Publication

Bhatnagar R. & Mehta P., "A coordinated Approach to Planning and Scheduling Decisions in Supply Chains with Dual Supply Modes", Research Paper.

Inter-University Project Title: Quality/Quantity Research-Empirical and Numerical Studies

Conference Publication

Tajan C. J. B., Sivakumar A. I. & Stanley B., "Performance of a serial-batch processor system with incompatible job families under simple control policies", SMA Annual Symposium, Singapore, 2006.