Publication list of Yen-Hsi Richard Tsai

Sept, 2018

Preprints

1. \( \theta \)-parareal schemes
   G. Ariel, H. Nguyen, and R. Tsai.

Under Review

2. Coupling IBIM and GBPM for interfacial flows with insoluble surfactant
   S.H. Hsu, M.-C. Lai, J. Chu, and R. Tsai. 2018

3. Autonomous exploration, reconstruction, and surveillance of 3D environments aided by deep learning
   L. Long and R. Tsai

4. Unsupervised Segmentation of Colonic Polyps with Narrow-Band Imaging based on Manifold Representation of Images and Wasserstein Distance
   I. N. Figueiredo, L. Pinto, P. Figueiredo, R. Tsai

5. A parareal-like domain decomposition algorithm for boundary value problems for Eikonal equations
   L. Martin and R. Tsai. 2018

6. Computer-aided diagnosis of polyps in white light colonoscopy, comparison of three different method
   P. N. Figueiredo, I. N. Figueiredo, L. Pinto, S. Kumarc, Y.-H. R. Tsai, A. V. Mamonov. 2018

Publications in Refereed Journals

7. Volumetric variational principles for a class of partial differential equations defined on surfaces and curves

8. Growth rate of crystal surfaces with several dislocation centers
   T. Ohtsuka, YHR Tsai, Y Giga. Cryst, Growth Des. 2018, 18, 1917-1929

9. An implicit boundary integral method for computing electric potential of macromolecules in solvent

    I.N. Figueiredo, C. Leal, L. Pinto, P.N. Figueiredo, R. Tsai. Biomedical Signal Processing and Control, 39, pp 486-502, 2018

11. An implicit boundary integral method for interfaces evolving by Mullins-Sekerka dynamics
An extrapolative approach to integration over hypersurfaces in the level set framework
DOI: https://doi.org/10.1090/mcom/3245

Implicit boundary integral methods for the exterior Neumann problems for the Helmholtz equation

Parareal methods for highly oscillatory ordinary differential equations

Integration over curves and surfaces defined by the closest point mapping

A level set approach reflecting sheet structure with single auxiliary function for evolving spirals on crystal surfaces

Fast sweeping methods for hyperbolic systems of conservation laws at steady state II

An efficient algorithm for a visibility based surveillance-evasion game

Automated polyp detection in colon capsule endoscopy

Iterated averaging of three-scale oscillatory systems

Heat Source Identification Based on L1 Constrained Minimization

Information-seeking control under visibility-based uncertainty

Fast sweeping methods for hyperbolic systems of conservation laws at steady state

An implicit interface boundary integral method for Poisson’s equation on arbitrary domains

Heterogeneous Multiscale Methods for ODEs

Optimal trajectories of curvature constrained motion in the Hamilton-Jacobi formulation

A multiscale method for highly oscillatory dynamical systems using a Poincaré map type technique

Point Source Identification in Non-Linear Advection-Diffusion-Reaction Systems

30. A multiscale technique for finding slow manifolds of stiff mechanical systems


32. Automatic Polyp Detection in Pillcam Colon 2 Capsule Images and Videos: Preliminary feasibility Report

33. Discovery of point sources in the Helmholtz equation posed in unknown domains with obstacles

34. Gaussian Beam Decomposition of High Frequency Wave Fields Using Expectation-Maximization

35. Numerical methods for smooth and crystalline mean curvature flow

36. A level set method for the Schrodinger equation with discontinuous potentials

37. Diffusion generated motion using signed distance functions

38. A reversible multiscale integration method

39. Gaussian beam decomposition of high frequency wave fields

40. Numerical multiscale methods for coupled oscillators

41. A multiscale method for highly oscillatory ordinary differential equations with resonance

42. Visibility of point clouds and exploratory path planning in unknown environments
   Y. Landa and R. Tsai. Communications in Mathematical Sciences., 6(4), 2008

43. Threshold dynamics for high order geometric motions
   S. Esedoglu, S. Ruuth, and R. Tsai. Interfaces and Free Boundaries, 10(3), 2008

44. Redistancing by flow of time dependent eikonal equation

45. Properties of a level set algorithm for the visibility problems
46. Threshold Dynamics for the piecewise constant Mumford-Shah Functional

47. Multi-valued solution and level set methods in computational high frequency wave propagation

48. Visibility Optimizations using Variational Approaches

49. Computing Multi-Valued Physical Observables for the High Frequency Limit of Symmetric Hyperbolic Systems

50. Total Variation and Level Set based Methods in Image Science

51. Discretization of the Dirac delta functions in Level Set Methods

52. Computing Multivalued Physical Observables for Semiclassical Limit of the Schrödinger Equation

53. Heterogeneous Multiscale Methods for Stiff ODEs

54. Fast Sweeping Algorithms for Hamilton-Jacobi Equations

55. Visibility and its Dynamics in a PDE Based Implicit Framework

56. Level Set Methods and Their Applications in Image Science

57. Estimation of 3D Surface Shape and Smooth Radiance from 2D Images: A Level Set Approach

58. Reflection in a Phase Space Based Level Set Framework

59. Fast Sweeping Methods for a Class of Hamilton-Jacobi Equations

60. A Level Sets Approach for Computing Discontinuous Solutions of Hamilton-Jacobi Equations

61. Geometric Optics in a Phase Space Based Level Set and Eulerian Framework

62. Rapid and Accurate Computation of the Distance Function Using Grids
Books

63. **Numerical Analysis of Multiscale Computations**  
   B. Engquist, O. Runborg, and Y.-H. R. Tsai,  
   Lecture Notes in Computational Science and Engineering 82, Springer-Verlag, 2011

Publications in Refereed Proceedings

64. **Dissimilarity Measure of Consecutive Frames in Wireless Capsule Endoscopy Videos: a way of searching for abnormalities**  
   I. N. Figueiredo, C. Leal, L. Pinto, P. N. Figueiredo, and R. Tsai. The proceedings of IEEE CBMS (30th IEEE International Symposium of Computer-Based Medical Systems), 2017

65. **On the reconstruction of dynamic permeability of cancellous bones**  

66. **Information gathering control via exploratory path planning**  
   L. Valence, Y-H R Tsai, and S. Soatto. Information Sciences and Systems (CISS), 2012

67. **Gaussian beam decomposition for seismic migration**  

68. **Oscillatory systems with three separated time scales – analysis and computation**  

69. **A Coupled Finite Difference - Gaussian Beam Method for High Frequency Wave Propagation**  

70. **A practical algorithm for vehicle path planning with curvature constraints: a Hamilton-Jacobi approach**  

71. **Discovering a point source in unknown environments**  

72. **Multiscale computations for highly oscillatory problems**  

73. **Threshold and redistancing dynamics for geometric motions**  

74. **Robotic path planning and visibility with limited sensor data**  

75. **Visibility of Point Clouds and Mapping of Unknown Environments**  
76. **Threshold Dynamics for shape reconstruction and disocclusion**  
Selim Esedoglu, Steven Ruuth, and Yen-Hsi Tsai. IEEE International Conference on Image Processing 2005

77. **Multiple time scale numerical methods for the inverted pendulum problem**  

78. **Level Set Methods in Image Science**  


---

### Technical Reports

80. **Visibility-Based Urban Exploration and Learning Using Point Clouds**  
M. Hielsberg, R. Tsai, P. Guo, and C. Chen

81. **Automatic detection and segmentation of colonic polyps in wireless capsule images**  
I. Figuerido, S. Prasath, Y.-H. R. Tsai, and P. Figuerido, 2010

82. **Autonomous Source Discovery and Navigation in Complicated Environments**  

83. **Supra-convergence of Time Dependent Linear PDEs on Irregular Grids**  

84. **A Numerical Study of Anisotropic Crystal Growth with Bunching under Very Singular Vertical Diffusion**  

85. **The Bivariate Contouring Problem**  

---

### Papers in Preparation

The manuscripts below are near completion.

86. **θ-parareal schemes for wave equations with multiscale coefficients**  
H. Nguyen and R. Tsai

87. **Discretization of a class of variational principles defined on closed surfaces via closest point extension**  
C. Chu, F. Izzo, O. Runborg and R. Tsai

88. **A simple finite element method for Laplace-Beltrami equations on non-parametric surfaces**  
C. Chu and R. Tsai

89. **Summations of unstructured point clouds sampled from geometrical objects of different Hausdorff dimensions**  
R. Tsai and C. Kublik
90. A minimizing movement algorithm for crystalline curvature motion of spirals
   T. Ohtsuka and R. Tsai

91. Numerical averaging over embedded tori invariant under non-mixing dynamics
   S. J. Kim, G. Ariel, and Y. Tsai