

## FOLKERT TANGERMAN RESUME

### 1. EDUCATION

- Ph.D. Mathematics, Boston University, Boston, MA, May, 1986.  
PhD Thesis, Boston University, 1986.  
Title: Meromorphic Continuation of Ruelle Zeta Functions.  
Thesis Advisor: Dr. David Fried.
- M.S. Mathematics, Groningen State University, the Netherlands, May 1983.

### 2. CAREER HISTORY

**2.1. Department of Mathematics, SUNY Stony Brook, Stony Brook, NY, Mar 2009-Current. Job Description:** Visiting Assistant Professor and R&D

#### Achievements:

- Calculus Instruction 2009-2019: MAT 125 and MAT 126.
- Summer Session I 2010: MAT 511
- Research Areas:
  - Fundamental Problems in Dynamical Systems and Renormalization
  - Applied Control Theory with JJP Veerman

**References for this period:** Dr. M. Lyubich; Dr. J. Milnor; Dr. S. Sutherland; Dr. H.W. Broer; and Dr. J.J.P. Veerman.

**2.2. Advanced Acoustic Concepts, Inc, Hauppauge, NY, May-June 2008. Job Description:** Senior Systems Engineer, consultant.

#### Achievements:

- SBIR N08-183 TITLE: *Next Generation Combat System Development Approach*. While unfunded, this SBIR (Small Business Innovative Research proposal) provides a rigorous methodology to implement netcentric systems in a practical manner, for very large systems (the NAVY), at a guaranteed Service Level (SLA) (Navy requirements: real time, (99.99999999% up-time), always on, one copy, verifiable, using hardware components that have limited reliability). A new ingredient is a *constructive mathematical logic* that appears to be *unknown* in this country, but very well known in the Netherlands (my country of origin). This SBIR gives an operational definition of Situational Awareness, and shows how to grow it. The scope of this SBIR was to demonstrate this approach on a new Navy program (Litoral Combat Ship).

**References for this period:** Dr. J. Pinezich; Captain Walter Wright, formerly Major Program Manager for LCS Mission Modules (PMS 420) and Commanding Officer of the Naval Surface Warfare Center, Corona, CA.

**2.3. Rockefeller University, NY, NY 10021, March 2008-June 2008 (Unpaid).** Co-organizer of the Rockefeller Mathematics Seminar, (see <http://mth.pdx.edu/veerman/list08.pdf>), with Dr. M. Feigenbaum and Dr. J.J.P. Veerman. The purpose of this seminar was to invite leading mathematicians and mathematical physicists from the greater New York area, for a presentation on their current research, and to produce a one page summary of their presentation.

**References for this period:** Dr. M. Feigenbaum, Rockefeller University; Dr. J.J.P. Veerman, Portland State University.

**2.4. Photon Research Associates, a Raytheon company, Defense Contractor, Port Jefferson, NY. Dec 2001-March 2008. Job Description:** Senior Scientist

**Accomplishments:**

- Development of initiatives, algorithms, analyses for Missile Defense.
- Analyzed system engineering, information extraction and propagation, in the decision making chain: launch detection through kill, via a diverse set of sensor systems (EO/RF) and communication channels, to weapon allocation and shoot.
- Advanced decision theory, data fusion, risk analysis, value of information, sensor resource management.
- Event detection, tracking, characterization and classification, automated learning.
- Led the development of sensor and scene generation modeling and simulation tools: C/C++ and Matlab.
- Decision tool integration, uncertainty, Bayesian Networks.

**References for this period:** Dr. R. Waters, Office Manager, PRA Port Jefferson Div; Dr. P. Barry, PRA consultant, former VP Northrop-Grumman; Dr. D. Burwell, Office Manager, PRA Arlington VA Div; Dr. B. Pierce, Program Manager, PRA Arlington VA Div, earlier Chief Architect/Engineer BMDO, Pentagon; Mr. I. Grev, Program Manager, PRA Arlington VA Div; Dr. M. Johnson, Technical Advisor to MDA Project Hercules, Schafer Corporation, Huntsville, AL; Dr. K. Priestersbach, Technical Advisor, MDA Project Hercules, Schafer Corporation, Huntsville, AL. Formerly, a collaborator, at Raytheon Missile Systems, Tucson, NM.

**2.5. Neutility Corp, Application Service Provider, Los Angeles, CA, March 2001-Oct 2001. Job Description:** Senior Scientist.

**Accomplishments:**

- R&D for new services: video on demand, multi user gaming, and office applications, for hosting from Hong Kong (PRC).
- Development of system requirements.
- Testing on COTS hardware: large multi-blade servers, Fiber SAN and RAID technology, OS: W2K and UNIX (SUN and RH Linux).

**Reference for this period:** Dr. Yuefan Deng, Department of Applied Mathematics and Statistics, University at Stony Brook, NY 11794-3600 T: 631.632.8370

**2.6. Applied Mathematics Department, SUNY Stony Brook, NY May 1992-March 2001. Job Description:** Research Professor

**Accomplishments:**

- Industry liaison: worked with numerous NY companies (IBM, Northrop-Grumman, Dayton T Brown, Ademco,..) to provide mathematical and statistical solutions to technical challenges.
- Led a team of students in the development and operation of a large Linux Beowulf cluster at Stony Brook for large scale simulations.
- Technical studies and development of modeling and simulation software for various applications: electromagnetic scattering, hydrodynamics, etching and deposition processes, crystal growth.
- Supervisor of graduate student dissertations.
- Taught and developed graduate and undergraduate courses.
- Authored numerous proposals and technical publications.
- Access to Brookhaven National Laboratory, Computational Science Division.
- Web Developer for the Department.

**References for this period:** Dr. J. Glimm, and Dr. Yuefan Deng.

**2.7. Various Mathematics Appointments. Job Description:** Assistant Professor. Position: Assistant Professor. Duties and accomplishments: Primary activities here were research, teaching, the running of seminars.

**2.8. Mathematics Department, SUNY Stony Brook, Aug 1989-Aug 1992.**

- SUNY Stony Brook, Aug 1989-Aug 1992, References: Dr. J. Milnor, and Dr. M. Lyubich, Department of Mathematics.
- Queens College, Flushing, NY, Aug 1988-Aug 1989, In addition I assisted Dr. Dennis Sullivan, Einstein Chair at the CUNY Graduate Center, with his Seminar. In addition with Dr. JJP. Veerman, we ran the Rockerfeller Math Seminar. References for this period: Dr. D. Sullivan, Dr. J. Dodziuk, Dr. M. Feigenbaum;
- Courant Institute, New York University, NY, NY, Aug 1986-Aug 1988. I also assisted Dr. Dennis Sullivan, Einstein Chair at the CUNY Graduate Center, with his Seminar. References for this period: Dr. P. Lax; Dr. H. McKean, Dr. D. Sullivan, Dr. J. Dodziuk, Chair. Dr. M. Feigenbaum.

## 2.9. Additional Unpaid Assignments.

- Referee for various journals.
- NSF proposal reviewer.
- Member of EEO/AA committee at Stony Brook University
- Member of the IT committee at Stony Brook University.

## 3. PUBLICATIONS OF FOLKERT TANGERMAN:

- (1) *Selfsimilarity and Growth in Birkhoff Sums for the Golden Rotation*, with O. Knill, submitted to *Nonlinearity*, 2010 and arxiv.
- (2) *Decentralized Linear Strings with Nearest Neighbor Interaction*, with J.J.P. Veerman, submitted to *Trans. Aut. Control Theory*, 2010.
- (3) *Automated Traffic and The Finite Size Resonance*, with J. J. P. Veerman, B. D. Stosic, *J. Stat. Phys.*, 2009.
- (4) *A two pressure numerical model of two fluid mixing*, with Glimm, J., Jin, H., Laforest, M., Tangerman, F.M., and Zhang, Y . *SIAM J. Multiscale Modeling and Simulation* 1: 458-484 (2003).
- (5) *Calculating Radiative Heat Transfer in an Axisymmetric Closed Chamber: An Application to Crystal Growth*, W. Garber and F. Tangerman, *Journal of Crystal Growth* 245,3, p 334-345, (1999).
- (6) *Carotid Body Chemoreceptor Firing During Hypoxia Does Not Demonstrate A Fractal Dimension With Poincare Plotting As Well As Statistical Analysis And Does Not Resemble Deterministic, Chaos and Is Thus Random*, A. Szema, D. Donnelly, F. Tangerman, K. Ye, S. Sutherland, and R.E. Dutton, (1999).
- (7) *MiDES Earth Sensor On Orbit Accuracy Compared to A High Performance Star Tracker*, G. Rullman (Servo Corp. of America), L. Anderson (Servo Corp. of America), A. Langmeier (Dasa/DSS), F. Tangerman, G. VanderWoude, *American Astronomical Society, AAS 90-9043*, (1999).
- (8) *Electromagnetic Scattering for Large Cavities: Iterative Methods*, with J. Asvestas, B. Bielefeld, Y. Deng, J. Glimm, and S. Simanca, *Communications of Applied Analysis*, Vol 2, pp 37-48, (1998).
- (9) *Front Tracking in Two and Three Dimensions*, with J. Glimm, M.J. Graham, J. Grove, X-L. Li, T.M. Smith, D. Tan and Q. Zhang, *Computers Math. Applic.*, Vol 35, No. 7, pp 1-11, (1998).
- (10) *Front tracking simulations of ion deposition and resputtering*, with J. Glimm, S.R. Simanca, D. Tan and G. Vanderwoude, *SIAM J. Sci. Comp.* Vol 20, 5, pp. 1905-1920, (1999).
- (11) *Applications of front tracking to the simulation of resin transfer modeling*, with Y. Song, W. Chui, J. Glimm, B. Lindquist, and F. Tangerman, *Computers & Mathematics with Applications*, (1997).
- (12) *Process Modeling in Resin Transfer Molding as a Method to Enhance Product Quality*, with W.K. Chui, J. Glimm, A.P. Jardine, J.S. Madsen, T.M. Donnellan, and R. Leek, *Siam Review*, Vol 39, No. 4, pp 714-727, (1997).
- (13) *Wave Fronts for Hamilton-Jacobi Equations: The General Theory for Riemann Solutions in  $R^n$* , with J. Glimm, H. Kranzer, D. Tan, and G. VanderWoude. *Comm. Math. Phys.*, Vol 187, No 3, pp 647-677, (1997).

- (14) *A parallel algorithm for multizone, multiphase systems with application to crystal growth*, with W.K. Chui, J.Glimm, H.Zhang, and V.Prasad, Journal of Crystal Growth, Vol 180, No 3-4, pp 534-542, (1997).
- (15) *Computational physics meets computational geometry*, with J. Glimm, S.R. Simanca, and T.Smith, Report No. SUNYSB-96-19, State University of New York at Stony Brook, (1996).
- (16) *Cantor sets on the line: scaling function and smoothness of the shift map*, with F. Przytycki, Nonlinearity, Vol 9, No 2, March (1996).
- (17) *Stochastic simulations of fluid mixing and other applications of the front tracking method*, with J.Glimm, M.J. Graham, and T.M. Smith, in High Performance Computing (1996), A.Tentner, ed., Society for Computer Simulation, San Diego, (1996).
- (18) *Porosity Migration in RTM* with W.K. Chui, J. Glimm, A.P. Jardine, J.S. Madsen, T.M. Donnellan, and R. Leek, In "Numerical Methods in Thermal Problems, Volume IX, Part 2", Eds R. W. Lewis and P. Durbetaki, Pineridge Press, Swansea U.K., pp 1323-1333, (1995).
- (19) *Modeling of Resin Transfer Molding*, with W.K. Chui, J. Glimm, A.P. Jardine and J. Madsen, The First Regional Symposium on Manufacturing Science and Technology, SUNY at Stony Brook, Ed. F-P Chiang, I. Kao and E.Pak, (1995).
- (20) *Electromagnetic Scattering: Iterative Methods for Solving Boundary Integral Equations*, with B. Bielefeld, Y. Deng, J. Glimm, J.S. Asvestas, Proc. Amer. Math. Soc, Vol 122, pp 719-726, (1994).
- (21) *Net Shape Simulation and Control*, with B. He, and G. VanderWoude, Proceedings of the National Thermal Spray Conference, Boston, \*(1994)\* Ed. C. Berndt, (1994).
- (22) *Dynamics of certain non-conformal degree two maps of the plane*, with B. Bielefeld, S. Sutherland and J.J.P. Veerman, Experiment. Math. 2 (1993), no. 4, 281-300.
- (23) *Incorporation of two dimensional front-tracking into PICS/ GCT 1.0*, with B.Bielefeld and W.B. Lindquist Report No. SUNYSB-AMS-93-07, State University of New York at Stony Brook, (1993).
- (24) *Differentiable Circle Maps with a Flat Interval*, with J. Graczyk, L. B. Jonker, G. Swiatek, J. J. P. Veerman Comm. Math. Phys. 173, 1995, 599-622.
- (25) *Intersection properties of invariant manifolds in certain twist maps*, with J.J.P. Veerman, Commun. Math.Phys, Vol 131, pp 245-265 (\*1991\*).
- (26) *Scalings in circle maps (II)*, with J.J.P. Veerman, Comm. Math. Phys., Vol 141, No 2, pp. 279-291 (1991).
- (27) *Scalings in circle maps (I)*, with J.J.P. Veerman, Comm. Math. Phys Vol 134, pp. 89-107 (1990).
- (28) *On Aubry Mather sets*, with J.J.P. Veerman, Phys D46 (1990).
- (29) *Asymptotic geometry of hyperbolic well-ordered Cantor sets*, with J.J.P. Veerman, J. Stat. Phys., Vol 59, No 1-2, 299-321 (1990).
- (30) *Reidemeister Torsion and analytic torsion*, preprint, 1988.
- (31) *Renormalization of Aubry Mather sets*, with J.J.P. Veerman, J. Stat. Phys. Vol 56, No 1-2, 83-98 (1989).

- (32) *Meromorphic continuation of Ruelle zeta functions*, Ph.D Thesis, Boston University, (1986).
- (33) *Dynamics of entire functions near the essential singularity*, with R.L. Devaney, *Erg. Th. and Dyn.Syst* (1986), 6, 489-503.
- (34) *From a differentiable to a real analytic perturbation theory*, application to the Kupka Smale theorems, with H.W. Broer, *Erg. Theory and Dyn.Syst* (1986), 6, 345-362.

**Work in Progress:**

- (1) *Stability of Linear Flocks on a Ring Road*, with J.J.P. Veerman and C. M. da Fonseca.
- (2) *Boundaries of Herman Rings for Conservative Systems*.
- (3) *Fundamental Problems On Area Preserving Mappings*, with A. de Carvalho. Draft is available on my webpage. Google "Folkert Tangerman Pure Research".
- (4) *Period Doubling: the Area Preserving Case*
- (5) *The Background of the Analytic Gabor Transform*.
- (6) *Analytic Properties of the Heat Operator I*, with S. Simanca, and S. Groth, in preparation.
- (7) *Analytic Properties of the Heat Operator II*, with S. Simanca, and S. Groth, in preparation.