

**Andrei Toom**  
Curriculum Vitae on July 27, 2012

*Address:*

Universidade Federal de Pernambuco  
Departamento de Estatística  
Recife/PE, 50740-540, Brazil

*Department phone, fax:* (55)-(81)-2126-8420, 8422, 8424

*Home and cellular phones:* (55)-(81)-3327-6709, 9252-2196.

*E-mail:* toom@de.ufpe.br, toom@ufpe.br, toom@member.ams.org

*Web page:* <http://www.de.ufpe.br/~toom/>

**Education**

**Ph.D. in Mathematics.** 1973. Lomonosov Moscow State University.  
*Thesis title:* Non-Ergodic Uniform Random Media [3, 10, 11, 12, 13].  
*Adviser:* Ilya I. Piatetski-Shapiro.

**M.Sc. in Mathematics.** 1968. Lomonosov Moscow State University.  
*Thesis title:* Complexity of Realization of Binary Functions with a Small Number of "Subfunctions" [2].

**Employment**

**June 2002 - March 2012:** Associate Professor, Department of Statistics, Federal University of Pernambuco, Brazil.

**September 1999 - May 2002:** Visiting Professor, Department of Statistics, Federal University of Pernambuco, Brazil.

**August 1997 - August 1999:** Visiting Scientist, Institute of Mathematics and Statistics, University of São Paulo, Brazil.

**August 1992 - May 1997:** Associate Professor (formerly Assistant Professor), Department of Mathematics, University of the Incarnate Word, San Antonio, Texas, USA.

**September 1991 - May 1992:** Lecturer, Department of Mathematics, University of Texas at Austin, Austin, Texas, USA.

**September 1990 - August 1991:** Research Associate, Computer Science Department, Boston University, Boston, Massachusetts, USA.

**February 1990 - May 1990:** Visiting Scholar, Center for Mathematical Sciences Research, Hill Center, Busch Campus, Rutgers University, New Brunswick, New Jersey, USA.

**November 1989 - January 1990:** Visiting Scientist, Department of Mathematics, University of Rome - 2, Italy.

**June 1966 - October 1989:** Senior Research Scientist (formerly Junior Research Scientist), Belozersky Research Institute of Physical and Chemical Biology, Lomonosov Moscow State University, Russia.

#### Areas of interest

- Random processes and their applications.
- Algorithms and complexity.
- Mathematical education.

**Languages:** Russian, English, Portuguese.

#### Membership

- American Mathematical Society.
- Sociedade Brasileira de Matemática.

### Theses advised by A. Toom at UFPE.

#### Undergraduate theses.

*Andréa Vanessa Rocha.* Senhora com Cachorro: Uma Explicação do Teorema Fundamental de Algebra. 2001.

*Hemilio Fernandes Campos Coelho.* Um Teorema que Pode Ser Usado na Percolação. 2003.

*Valmir Rogério da Silva.* O Paradoxo de Simpson. 2004.

*Andréa Conceição de Souza Leite.* Teoria de Erodentes. 2004.

*Rodrigo Bernardo da Silva.* Vida e Morte no Papel Quadriculado. 2005.

*Daniel Cassimiro Carneiro da Cunha.* Sobre Valores Críticos para Alguns Processos Estocásticos com Interação Local no  $R^2$ . 2006.

*Ricardo José Ferreira.* Problemas Matemáticos Envolvendo Provas Teóricas. 2006.

*Samuel Victor Medeiros de Macêdo.* Processo Flip-Matança-Mitosis. 2008.

### **Master theses.**

*Pedro Ferreira de Lima.* Teoremas de dualidade usados em percolação. 2002.

*Moisés Lima de Menezes.* Comportamento de um autômato celular sem e com ruído aleatório. 2003.

*Andréa Vanessa Rocha.* Propriedades de medidas invariantes não-triviais de autômatos celulares. 2005.

*Renata Nunes de Souza Pereira.* Ergodicidade de um eroder unidimensional com ruído aleatório. 2005.

*Daniela Trentin Nava.* Processos de passeio na reta contínua. 2006.

*Murilo de Medeiros Sampaio.* Lei dos grandes números na percolação multi-dimensional. 2007.

### **Doctoral theses.**

*Alex Dias Ramos.* Processos de partículas com comprimento variável. 2007.

*Calitéia Santana de Sousa.* Processos de partículas sem colisões. 2007.

*Andrea Vanessa Rocha.* Operadores de substituição. 2009.

*Luis Henrique de Santana.* Velocities à la Galperin in Continuous Spaces. 2012.

## Publications

### ..... 1963-1970 .....

- [1] A. Toom. The Complexity of a Scheme of Functional Elements Realizing the Multiplication of Integers. Published in English in *Soviet Mathematics (Doklady)*, 1963, v.3, pp. 714-716. Originally published in Russian in *Doklady Akad. Nauk USSR*, v.150, n. 3, 1963, pp. 496-498.
- [2] A. Toom. Complexity of Realization of Binary Functions with a Small Number of "Subfunctions". *Syst. Theory Res.*, 1968, v. 18, pp. 77-84. (Originally published in Russian.)
- [3] A. Toom. A Family of Uniform Nets of Formal Neurons. *Soviet Math. (Doklady)*, 1968, v.9 n.6, pp. 1338-1341. (Originally published in Russian.)
- [4] M. L. Tzetlin. Research into Automata Theory and Modeling of Biological Systems. Ed. by M. B. Berkinblit and A. L. Toom. "Nauka", Moscow, 1969. (In Russian.) Published in English as *Automaton Theory and Modeling of Biological Systems*. Academic Press, 1973.
- [5] A. Toom. On a simplified description of games of asymptotically-optimal automata. In collaboration with V. I. Krinsky and I. I. Piatetski-Shapiro. *Ibid.*, pp. 290-294 of Russian ed., pp. 247-251 of translation.
- [6] A. Toom. Problems of the oral examination in mathematics. Moscow University Press, Moscow, 1970. In collaboration with V. Gutenmaher, N. Vasilyev, and J. Rabbot. (In Russian.)
- [7] Michael J. Apter. *Cybernetics and Development*. Translated from English into Russian by A. L. Toom. Ed. by I. I. Piatetski-Shapiro. "Mir", Moscow, 1970.

### ..... 1971-1975 .....

- [8] A. Toom. Distribution of Units in Macromolecular Reactions. *Preprints of the International Conference of Chemical Transformations of Polymers*. Bratislava, 1971. In collaboration with A. Litmanovitch, O. Noah, N. Plate and N. Vasilyev.
- [9] A. Toom. Solutions of problems of the entrance examinations of the School by Correspondence. 1971, n. 6, pp. 25-29.

- [10] A. Toom. Non-Ergodicity in Uniform Random Media. *Probabilistical Methods of Investigation*, issue 41. Ed. by A. Kolmogorov. Moscow University Press, 1972, pp. 34-42. (In Russian.)
- [11] A. Toom. On Invariant Measures in Non-Ergodic Random Media. *Ibid*, pp. 43-51 (In Russian.)
- [12] A. Toom. Non-Ergodic Uniform Random Media. Ph.D. thesis, 1973. Deposited at VAK. Manuscript available on request. (In Russian.)
- [13] A. Toom. Non-Ergodic Uniform Random Media. Auto-referat of Ph. D. thesis, 1973. Deposited at Lomonosov Moscow State University, VAK and Lenin Library. (In Russian.)
- [14] N. Vasilyev, L. Mityushin, I. Piatetski-Shapiro and A. Toom. Stavskaya Operators. *Preprint #12 of Institute of Applied Mathematics of Academy of Sciences of USSR*, Moscow, 1973. (In Russian.)
- [15] O. Noah, N. Vasilyev, A. Litmanovitch, N. Plate and A. Toom. Distribution of Units in Macromolecular Reactions with The Effect of Neighbor Groups. *High Molecular Compounds*, 1973, v. 15A, pp. 877-887. (In Russian.)
- [16] A. Toom. Ways of Decision Making in a Class of Games. *Technical Cybernetics*, 1973, n. 3, pp. 16-21. (In Russian.)
- [17] A. Toom. In a quiet harbor. *Kvant*, 1973, n.4, p.34.
- [18] A. Toom. Non-Ergodic Multidimensional Systems of Automata. *Problems of Information Transmission*, 1974, v. 10, pp. 239-246. (Originally published in Russian.)
- [19] O. Noah, N. Vasilyev, A. Litmanovitch, N. Plate and A. Toom. Methods of Calculation of Compositional Distribution in Products of Polymeranalogical Reactions. *High Molecular Compounds*, 1974, v. 16A, pp. 412-422. (In Russian.)
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- [21] A. Toom and A. Trudolyubov. Reflexive Interrelations in a Collective. *Ideen des exacten Wissens*, Stuttgart, 1974, n. 3. (In German.)

- [22] V. Gutenmacher, J. Rabbot and A. Toom. Solutions of problems. *Kvant*, 1974, n. 8. (In Russian.)
- .....**1976-1980**.....
- [23] A.Toom. Monotonic Binary Cellular Automata. *Problems of Information Transmission*, 1976, v. 12, n. 1, pp. 33-37. (Originally published in Russian.)
- [24] A.Toom and L. Mityushin. Two Results regarding Non-Computability for Univariate Cellular Automata. *Problems of Information Transmission*, 1976, v. 12, n. 2, pp. 135-140. (Originally published in Russian.)
- [25] A. Toom. Unstable Multicomponent Systems. *Problems of Information Transmission*, 1976, v. 12, n. 3, pp. 220-224. (Originally published in Russian.)
- [26] A. Toom. Non-Ergodic Evolutionary Systems. *Preprints of the 4-th International Symposium on the Information Theory*, 1976, pp. 143-144. (In Russian.)
- [27] A. Toom. The Monopoly of Word as The Power Factor in Games. *Semiotics and Informatics*, Moscow, VINITI, 1976, Issue 7, pp. 112-127. (In Russian with an abstract in English.)
- [28] *Locally Interacting Systems and Their Application in Biology*. Ed. by R. Dobrushin, V. Kryukov and A. Toom. Lecture Notes in Mathematics, Springer, 1978, v. 653. (Originally published in Russian.)
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- [31] *Interaction Markov Processes and their Application to Biology*. Ed. by R. L. Dobrushin, V. I. Kryukov and A. L. Toom. Pushchino, 1979. (In Russian.)
- [32] A. Toom. Stability in Lattice Systems with Local Prohibitions. *Ibid.*, pp. 74-99.(In Russian.)
- [33] A. Toom. Lattice Systems with Local Prohibitions. *The Fifth International Symposium on Information Theory. Abstracts of Papers*. Moscow-Tbilisi, 1979, part II, pp. 165-168. (In Russian.)

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- [47] A. Toom. Inkblots on The Plane. *Kvant*, 1985, n. 9, pp. 47-48. (In Russian.)
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- .....**1986-1990**.....
- [52] From Pavel Antokolsky's Diaries. Publication, introduction and comments by Andre Toom. *Voprosy Literaturny*, 1986, n. 12, pp. 157-180. (In Russian.)
- [53] A. Toom. On Reliable Simulation in Real Time. *First World Congress of the Bernoulli Society for Mathematical Statistics and Probability Theory. Abstracts*. Vol. II, p. 676. 1986.
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- [63] Thomas M. Liggett. Interacting Particle Systems. Translated from English into Russian by S. B. Shlosman and A. L. Toom. Ed. by R. L. Dobrushin. "Mir", Moscow, 1989.
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- [71] *Stochastic Cellular Systems : ergodicity, memory, morphogenesis*. Ed. by R. Dobrushin, V. Kryukov and A. Toom. Nonlinear Science: theory and applications, Manchester University Press, 1990.

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- [75] A. Toom. Equations we Manage to Solve. *Kvant*, 1990, n. 2, pp. 55-57. (In Russian.)
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 .....**1991-1995**.....
- [78] A. Toom. Decentralize Aid. (Letter to editor.) *New York Times*, 1991, January 10, p. A24.
- [79] A. Toom. A Russian Teacher in America. *Journal of Mathematical Behavior*, 1993, v. 12, n. 2, pp. 117-139. Reprinted with variations in:  
*American Educator*, Fall 1993, pp. 9-25.  
*Focus*, 1996, v. 16, n. 3, pp. 9-11 and n. 4, pp. 9-11.  
*Distant Mirrors: America as a Foreign Culture*. Ed. by Philip R. DeVita and James D. Armstrong. 2d edition. Wadsworth, 1998, pp. 108-124. ISBN/ISSN 0-534-25734-8. A Russian translation is published in the journal "Matematika", 2004, nn. 38, 39 and in "Vestnik Moskovskogo Universiteta", series 20 "Pedagogicheskoe Obrazovanie", 2005, n. 2, pp. 59-83.
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- [81] A Russian Looks at US (Interview with A. Toom.) *Palo Alto Review* (Palo Alto College, San Antonio, Texas), Fall 1993, pp. 38-43.
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