Tuomas Hytönen: Curriculum Vitae

Date: January 14, 2019

PERSONAL INFORMATION

Family name, first names:	Hytönen, <u>Tuomas</u> Pentinpoika
Researcher unique identifiers:	ORCID: 0000-0003-2911-2391
	Mathematical Reviews Author ID: 744370
Date of birth:	16/05/1981
Nationality:	Finland
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- ## EDUCATION

2003	Doctor of Science	(major: Mathematics),	Helsinki University of Technology,	Finland
2001	Master of Science	”	”	”

- ## CURRENT POSITION

2015– Professor of Mathematics, University of Helsinki, Finland

- ## PREVIOUS POSITIONS

2011–2015	Associate Professor	⎫
2010–2011	Academy Research Fellow	⎬ University of Helsinki, Finland
2006–2009	Researcher/Postdoc	⎭
2005–2006	Assistant/Postdoc, University of Turku, Finland	
2004–2005	Postdoc, Delft University of Technology, Netherlands	
2002 (5 months)	Marie Curie Fellow (exchange PhD student), Univ. Karslruhe, Germany	
2001–2003	Research Fellow (PhD student), Helsinki University of Technology, Finland	

- ## FELLOWSHIPS AND AWARDS

2017	ISAAC award (International Society for Analysis, its Applications and Computation) "to a young, outstanding researcher"
2013	Väisälä Award (Finnish Academy of Science and Letters) "to promising scientists at an active stage in their careers"
2004	Dissertation Award, Finnish Academy of Science and Letters
2002	McKinsey Award (Helsinki University of Technology and McKinsey Company) "for the best graduating student in 2001"

- ## SUPERVISION OF PhD STUDENTS AND POSTDOCS

2007–2017   6 supervised PhD students,   4 supervised postdocs   (University of Helsinki)

- ## PUBLICATION ACTIVITIES (according to mathscinet.ams.org)

2004–2018	75 articles in refereed journals, 8 in refereed proceedings, 2 monographs
”	cited 1199 times by 436 authors; h-index 20

- **TEACHING ACTIVITIES**

2017–2018   Lecturer of $2 \sim 4$ mostly graduate courses of $7 \sim 14$ weeks (total ~ 28 weeks) per year
University of Helsinki (regular teaching load)

2011–2016   Lecturer of 5 international minicourses on current research in Harmonic Analysis
Sevilla, Madrid, Santander (Spain); Yaounde (Cameroon); Nantes (France)

2008–2016   Lecturer of ~ 1 graduate course of ~ 7 weeks per year
University of Helsinki (reduced teaching via grants)

- **ORGANISATION OF SCIENTIFIC MEETINGS**

2012–2016   Main organiser of 3 workshops (ca. 40–50 participants) on Singular Integrals, Finland

2014   Main organiser, Finnish–Estonian Math Colloquium (ca. 180 participants), Finland

2013   Session co-organiser, 26th Nordic Congress of Mathematicians, Sweden

- **INSTITUTIONAL RESPONSIBILITIES**

2018– (Sep–)   Head of Department of Mathematics and Statistics, U. of Helsinki

2018 (Jan–Aug)   Vice-Director, Dept. of Mathematics and Statistics, U. of Helsinki

2018–   Faculty Council Member, Faculty of Science, U. of Helsinki

2016–2018   Co-organiser, joint Analysis & PDE seminar, U. of Helsinki & Aalto U.

2013   Czar of the Colloquium of Dept. of Mathematics and Statistics, U. of Helsinki

- **EDITORIAL WORK**

2018–   Editorial Board, Journal of the European Mathematical Society

2012–   Editorial Board, Archiv der Mathematik (Basel), Switzerland

2012–   Editorial Advisory Board, four journals of the London Mathematical Society, UK

- **OTHER COMMISSIONS OF TRUST**

2018   Finnish Delegate, General Assembly of the International Mathematical Union (IMU-GA)

2018–   Board Member, Mathematics Fund of the Finnish Academy of Science and Letters

2017   Scientific evaluation for junior leadership positions, University of Turku, Finland

2016–   Member, Finnish National Committee for Mathematics

2015–   Advisory Board, Union of Finnish Folk High Schools

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

2018–   International Society for Analysis, its Applications and Computation (ISAAC)

2017–   Finnish Academy of Science and Letters

2017–   Finnish Society of Sciences and Letters

- **MAJOR COLLABORATIONS** (past and current, alphabetical)

Lacey, Michael	Weighted norm inequalities / Time–frequency analysis	Georgia Inst. of Technology, USA
Martikainen, Henri	Dyadic analysis, Tb theorems	U. of Helsinki, Finland
McIntosh, Alan†	Harmonic analysis of PDE	Australian National U., Australia
Naor, Assaf	Analysis in Banach spaces	Princeton University, USA
Pérez, Carlos	Weighted norm inequalities	U. de Sevilla / U. del Pais Vasco, Spain
Rosén, Andreas	Harmonic analysis of PDE	U. of Gothenburg, Sweden
van Neerven, Jan / Veraar, Mark / Weis, Lutz	Monograph project on Analysis in Banach spaces	Delft U. of Technology, Netherlands / Karslruhe Inst. of Technology, Germany

- **CAREER BREAKS** (total 14.5 months)

14/07/2003–09/01/2004	Military service, Finnish Defence Forces (6 months)
01/01/2013–19/04/2013 ⎫ 06/05/2013–07/06/2013 ⎭	Parental leave with first child (4.5 months)
08/08/2016–13/12/2016	Parental leave with second child (4 months)

- **RESEARCH OVERVIEW**

My work is centred around singular integrals of harmonic analysis in several contexts. Ten years ago, I extended my early-career interest in **Banach spaces** (continued i.a. in the monographs [11, 12]) to **non-homogeneous measures**, setting up [1] and developing (i.a. [2]) a new influential framework (cf. citations). These methods also inspired a major breakthrough [3] in **weighted inequalities** that then became my main focus, continued i.a. in [4, 5]. During 2011–2016, I led a successful ERC Starting Grant ANPROB, resolving major challenges in all these areas [6, 7, 8], and adding a **PDE** (partial differential equations) component in [9]. My latest opening is on **commutator estimates** [10].

1. **Ten representative publications** (chronological; citations according to mathscinet.ams.org)

   1. T. Hytönen, A framework for non-homogeneous analysis on metric spaces, and the RBMO space of Tolsa. *Publ. Mat.* 54 (2010), no. 2, 485–504. – **cited 64 times**.

   2. T. Hytönen, H. Martikainen, Non-homogeneous Tb theorem and random dyadic cubes on metric measure spaces. *J. Geom. Anal.* 22 (2012), no. 4, 1071–1107. – **cited 68 times**.

   3. **T. Hytönen, The sharp weighted bound for general Calderón-Zygmund operators. Ann. of Math. (2)** 175 (2012), no. 3, 1473–1506. – **cited 137 times.**

   4. T. Hytönen, C. Pérez, Sharp weighted bounds involving A_∞. *Anal. PDE* 6 (2013), no. 4, 777–818. – **cited 88 times**.

   5. T. Hytönen, C. Pérez, S. Treil, A. Volberg, Sharp weighted estimates for dyadic shifts and the A_2 conjecture. *J. Reine Angew. Math.* 687 (2014), 43–86. – **cited 47 times**.

   6. T. Hytönen, H. Martikainen, Non-homogeneous $T1$ theorem for bi-parameter singular integrals. *Adv. Math.* 261 (2014), 220–273. – cited 13 times.

   7. T. Hytönen, S. Li, A. Naor, Quantitative affine approximation for UMD targets. *Discrete Anal.* 2016, Paper 6. – **cited in gowers.wordpress.com**/2016/03/01/discrete-analysis-launched/

   8. T. Hytönen, The two-weight inequality for the Hilbert transform with general measures, *Proc. London Math. Soc.* 117 (2018), no. 3, 483–526.

   9. T. Hytönen, A. Rosén, Bounded variation approximation of L_p dyadic martingales and solutions to elliptic equations, *J. Eur. Math. Soc.* 20 (2018), no. 8, 1819–1850.

   10. T. Hytönen, The L^p-to-L^q boundedness of commutators with applications to the Jacobian operator, preprint (2018), online at arxiv.org/abs/1804.11167

2. **Research monographs (2 volumes, > 600 + 600 pages)**

   11. T. Hytönen, J. van Neerven, M. Veraar, L. Weis: *Analysis in Banach spaces. Vol. I. Martingales and Littlewood-Paley theory.* Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge, 63. Springer, Cham, 2016. xvi+614 pp. ISBN: 978-3-319-48519-5; 978-3-319-48520-1.

   12. T. Hytönen, J. van Neerven, M. Veraar, L. Weis: *Analysis in Banach spaces. Vol. II. Probabilistic methods and operator theory.* Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge, 67. Springer, Cham, 2017. xxi+616 pp. ISBN: 978-3-319-69807-6; 978-3-319-69808-3.

- **MAJOR EXTERNAL FUNDING** (total > 2 M€ in the past 10 years)

2018–2022	Academy of Finland project grant "Frontiers of singular integrals"	0.6 M€
2011–2016	**ERC Starting Grant** ANPROB	1.1 M€
2010–2013	Academy of Finland two-partner consortium, in which my share was	0.4 M€
2009–2014	Academy of Finland, Academy Research Fellow's project grant	0.2 M€

- **SELECTED INVITED PRESENTATIONS** (on all inhabited continents)

2018	**(plenary) ICM Satellite Conference Harmonic Analysis**, Porto Alegre, Brazil
"	Séminaire d'Analyse Fonctionnelle, Paris VI, France
"	Conference Celebrating the Mathematical Legacy of Alan McIntosh, Canberra, Australia
2017	(plenary) 11th ISAAC (Int'l Soc. Analysis, Applications & Computation) congress, Sweden
"	(plenary) 23rd Rolf Nevanlinna Colloquium, Zürich, Switzerland
"	MSRI workshop "Recent trends in harmonic analysis", Berkeley, USA
2016	**(plenary) 27th Nordic Congress of Mathematicians**, Stockholm, Sweden
"	(plenary) "Function spaces, differential operators & nonlinear analysis", Prague, Czech Rep.
2015	(minicourse lecturer) CIMPA-UMA Ecole Mathématique Africaine, Yaounde, Cameroon
2014	**International Congress of Mathematicians ICM**, Seoul, South Korea
"	(minicourse lecturer) EMS-RSME Santaló summer school, Santander, Spain
2013	Joint Int'l Meeting of the American and Romanian Math. Societies, Alba Iulia, Romania
2012	9th International Conference on Harmonic Analysis & PDE, El Escorial, Spain
2011	MSRI workshop "Probabilistic Reasoning in Quantitative Geometry", Berkeley, USA