
Curriculum Vitae

Personal Details

Title(s), first name, surname: dr. ir. J.A. (Johan) Pouwelse
Date of birth: 19 Dec, 1972
Nationality: Dutch



Master's ("doctoraal")

University/Collega of Higher Education: Delft University of Technology
Date (dd/mm/yy): 30/01/98 (**Cum Laude**)
Main subject: Computer Science / Distributed Systems

Doctorate

University: Delft University of Technology
Starting Date (dd/mm/yy): 01/02/98
Date of PhD award (dd/mm/yy): 20/10/03
Supervisor ('Promotor'): prof. dr. H.J. Sips
Title of thesis: Power Management for Portable Devices

Work experience since completing your PhD

Position	Period	fte amount	Type of position	Institution
PhD student	Feb 1998 – Oct 2003	0.8	fixed term	TU Delft
Researcher	Feb 1998 – Oct 2003	0.2	fixed term	TNO
Postdoc	Oct 2003 – May 2006	1.0	fixed term	TU Delft
Assistant prof.	May 2006 – July 2013	0.9 – 1.0	permanent	TU Delft
Visiting Scientist	July 2006 – Sep 2011	0.1	other	Harvard University
Associate prof.	July 2013 – <i>present</i>	1.0	permanent	TU Delft

Personal scientific mission

Throughout my whole academic career, I have devoted myself to closing the gap between theory and practice by exploring fundamental underpinnings to build real systems with strong properties.

I am fascinated by the key factor which makes online communities fail, survive, or thrive: trust. For the past 20 years I have been experimenting with algorithms, mechanisms, and ledgers to create trust. My personal scientific mission is to develop the universal trust machine and get millions of strangers to collaborate.

Academic staff supervised

	Promotor (formal supervisor)	Co-promotor (formal co-supervisor)	Role as (co-) supervisor
PhDs Upcoming	4 funded vacancies, ongoing hiring		
Ongoing	Martijn de Vos, Quinten Stokkink, Bulat Nasrulin		Obtained Ius Promovendi Jan 2018
Succesfully completed		Riccardo Petrocco, Niels Zeilemaker, Mihai Capota, Dimitra Gkorou, Adele Lu Jia, Rameez Rahman, Rahim Delaviz Aghbolagh, Lucia D'Acunto, Boxun Zhang, Nitin Chiluka Jan-David Mol, Pawel Garbacki, Michel Meulpolder, Jenneke Fokker	Supervisor, promotor delegated most supervision daily supervisor
<i>Subtotal PhDs</i>	7	14	
Postdocs	Georgy Ishmaev, Can Umut Ilerí, Cor-Paul Bezemer, Paolo Palmieri, Niels Zeilemaker, Micheal Rogers, Tamas Vinko, Nazareno Andrade, Victor Grishchenko, David Hales, Jacco Taal, Arno Bakker, Gertjan Halkes		supervisor
<i>Subtotal Postdocs</i>	13		
Other Scientific Developers	Egbert Bouman, Vadim Bulavintsev, Alexander Kozlovsky, Andrei Andreev, Sandip Pandey, Elric Milon, Boudewijn Schoon, Lipu Fei, Diego Rabaoli, Jie Yang, Jun Wang		supervisor
<i>Subtotal Other</i>	11		

International activities

Before starting a family I frequently lived abroad. This enabled me to build a large international network of collaborators. List of international research visits:

- Summers of: 2007, 2008, 2009, 2010 and 2011, Harvard School of Engineering, Boston, US. Developed novel incentives for cooperation and concept of bandwidth as a currency as a visiting professor to the Harvard EconCS group from Professor David Parkes. Our earlier work together brought the economic principle of resource pricing to the world of P2P to improve efficiency.
- Jun 2006 – Aug 2006, Harvard Business School, Boston, US. Invited to work at Harvard and helped conduct an economic impact study of P2P. Specifically, the impact of Bittorrent on Hollywood.
- Jul 2005 – Sep 2005, Philips Research Asia, Shanghai, China. Explored within Philips the business and market possibilities of the Peer-to-Peer technology of Delft University.
- Jul 2003 – Sep 2003, Massachusetts Institute of Technology (MIT), Boston. Worked as a visiting scientist at the Peer-to-Peer research group of MIT. Created an infrastructure for real-time performance measurements of the Bittorrent/Suprnova.org P2P file sharing system.
- Apr 2001, Seoul National University, Korea. Short stay for exchange of research ideas on power management and cooperation for building embedded hardware for processor voltage scaling research.
- Sep 2000 – Dec 2000, NEC research laboratory, Tokyo, Japan. Developed embedded software at the NEC image processing department. Accelerated image processing operations using MMX assembly.

List of international collaborations:

- **David Parkes, Harvard University.** With my long-term collaborator we saw the field of “blockchain technology” emerge from our field of “distributed accounting systems”. David has a game theory background, which complements my distributed systems expertise very well.
- **Pateek Mittal, Princeton University.** We share a deep passion for privacy-enhancing technology and addressing the Sybil attack.
- **Pēteris Zilgalvis, Head of Unit for Startups and Innovation in the Digital Single Market Directorate, European Commission** Together with Pēteris and his team we are creating the enablers for a healthy European Blockchain ecosystem.

Other academic activities

My academic activities include promoting the funding of science and industry sponsorship. As the first scientist in the country working on distributed ledger technology I’m offered speaking opportunities on a regular basis. On several occasions I had the honor of speaking after distinguished speakers, for instance, ministers, royal family members, and European Commission representatives. *Highlights* of scientific talks:

- **4th Blockchain Summit (London, 22 March 2018)** —Invited talk about our “live token economy based on Trustchain”.
- **Bruegel Foundation event (Brussels, 6 Feb 2018)** —Invited talk at Bruegel Think Tank “The implications of Blockchain platforms” with European Commission representatives.
- **Stanford University blockchain event (California, 24 Jan 2018)** —Invited talk “Trustchain: micro-economy for bandwidth tokens” at “Blockchain Protocol Analysis and Security Engineering”.
- **Blockchain Future of Trust Summit (Den Haag, Knights Hall (“de Ridderzaal”), 28 Sep 2017)** —Invited talk on understanding trust and blockchain¹.
- **International One Conference 2017 — NCSC (Den Haag, 16 May 2017)** —Invited talk “The made-in-Holland blockchain to create trust”.
- **Ministry of Economic Affairs (Den Haag, 30 March 2017)** —Invited talk at the creation of the National Blockchain Coalition with minister Henk Kamp².

In 2020 I’ve started a new scientific venue. In my role as **general chair** we launched the **ACM/IFIP “1st International Workshop on Distributed Infrastructure for Common Good”**. As part of my academic service, young faculty members now have a venue to submit work in the new emerging field of “Big Tech alternatives”. The European Commission has kindly agreed to deliver a keynote. Digital sovereignty is a key issue in Brussels and with growth of our scientific community this topic could qualify for funding. Program committee membership and reviewing duties for various venues:

- ACM/IFIP DICG (Distributed Infrastructure for Common Good) (2020, general chair, see above)
- IEEE P2P (International Conference on Peer-to-Peer Computing) (2010, 2011, 2012, 2013, 2015)
- Middleware (ACM/IFIP/USENIX Middleware conference) (2014, 2015, 2016)
- WWW (International World Wide Web Conference) (2015)
- IEEE Infocom (IEEE International Conference on Computer Communications) (2013)
- ECIR (European Conference on Information Retrieval) (2013)
- EUSIPCO (IEEE European Signal Processing Conference) (2012)
- IEEE WoWMoM (Int. Symp. on World of Wireless Mobile & Multimedia Networks) (2011)

¹<http://www.youtube.com/watch?v=4k7tw9Ty3uk>

²<http://twitter.com/MinisterieEZ/status/847382308462051330>

My pre-blockchain, non-blockchain, and activities outside the traditional academic settings:

- **Keynote of the joined session of ICCAS'15, SASO'15, and P2P'15 (Cambridge, USA, September 24 2015)** —The keynote speaker at: IEEE International Conference on Cloud and Autonomic Computing, IEEE International Conference on Self-Adaptive and Self-Organizing Systems, and 15th IEEE International conference on Peer-to-Peer computing.
- **Princeton University (Princeton, USA, December 1 2014)** —Invited seminar at Princeton³ titled “Anonymous HD Video Streaming and Reputations”.
- **Internet Engineering Task Force meeting 86 (2012 —2014)** —Founded and organised a widely attended meeting series to define a standard against Internet censorship⁴.
- **Stanford University (Stanford, USA, May 30 2012)** —Class lecture for Computer Systems Colloquium course EE380 at Stanford⁵ detailing our self-organising systems research, titled “Tribler: 4th generation peer-to-peer technology”.
- **Google Europe headquarters (Zurich, Switzerland, February 9 2010)** —Delivered a Google Tech Talk⁶ titled “Searching within the P2P world”.
- **Court appearances as expert witness**
The Hague, NL, June 29 2010 – State vs. Releases4u
Boston, USA, 22 June 2009 – Sony vs. Tenenbaum
New York, USA, 13 February 2008 – UMG Recording Inc. et al. vs. Lindor Zwolle-Lelystad, NL, March 14 2007 – Stokke AS vs. Marktplaats BV
Amsterdam, NL, July 13 2006 – BREIN vs. UPC Netherlands
- **Federal Trade Commission (Washington, USA, December 15-16 2004)** —Delivered an oral statement concerning “The Future of P2P Technology: Effects on Efficiency and Competition” to FTC Commissioner Pamela Jones Harbour, Senator Gordon Smith, and others.

Scholarships, grants and prizes

The funding strategy has been fundamental to the success of the Tribler Lab. By adopting real problems of our government and industry we gained experience and build long-enduring partnerships. These partnerships led to both funding success (7,499,019) and challenged our fundamental research. Our scientific breakthroughs are all empowered by first-hand experience.

³<http://www.ee.princeton.edu/events/anonymous-hd-video-streaming-and-reputations>

⁴<http://www.internetsociety.org/articles/moving-toward-censorship-free-internet>

⁵<http://www.youtube.com/watch?v=JQiLaKdzDOE>

⁶<http://www.youtube.com/watch?v=ZXWmhreGiAU>

Scholarship/Grant/Prize Formal overall project lead	Amount in euro's	Amount for my team in Delft	Year of award
Blockchain and Identity NWO project This project is officially partnered with the government agency responsible for the Dutch passport. Aim: blockchain-based passport on smartphones suitable for cross-border travel.	2,100,000	2,100,000	2018
NWO project Blockchain and Logistics The objective of this project is to show unequivocally the business value of the blockchain in logistics.	1,450,000	540,000	2016
ABN AMRO innovation center Direct funding to create a fully operational minimal viable product of a blockchain-based mortgage market.	200,000	200,000	2016
<i>Subtotal</i>	3,750,000	2,840,000	
Formal applicant			
EU European Institute of Technology (EIT) grant Software will be devised for "Distributed Payment Processing". Our software is the first cloud-based elastic payment infrastructure.	270,000	70,000	2012
EU FP7 FET project QLectives QLectives is a project bringing together top social modelers, peer-to-peer engineers and physicists to design and deploy next generation self-organising socially intelligent information systems. I was the sole technical director and responsible for all scientific experiments.	6,934,554	1,490,930	2008
EU FP7 project P2P-Next P2P-Next binds leading European players (BBC, European Broadcasters Union, Pioneer, VTT, etc.) to define the next-generation of P2P technology. This project completed in 2012. As the technical & scientific director for P2P-Next I had sole final responsibility for all tech/science matters.	19,587,377	1,977,679	2007
Dutch NWO VENI grant Personal grant for development of online TV channels.	200,000	200,000	2005
<i>Subtotal</i>	26,811,931	3,738,609	
Formal co-applicant			
EU FP6 project P2P-Fusion P2P-FUSION addressed the difficulties in the legal creative reuse of online media. It created an open, accessible, legal and economically efficient environment for creative audiovisual cultural activities.	3,173,073	920,410	2006
<i>Subtotal</i>	3,173,073	920,410	
<i>Total</i>	33,735,004	7,499,019	

Output indicators

Since 1999, I have (co-)authored a total of over **134** peer reviewed papers, which have been cited over 5334 times. I have a "h-index" of 32 and an i10-index of 79, according to *scholar.google.com*⁷. I have authored 12 highly cited journal publications.

Output indicator	Amount or number
Peer reviewed papers	134
Number of citations	5334
Papers with 1000 citations	1
H-index	32
i10-index	79
Journal publications	12

We see talented individuals as another form of scientific output. I established the blockchain mini-

⁷<https://scholar.google.nl/citations?user=pqrQKjUAAAAJ>

master at Delft, consisting of three master courses⁸. Every year we educate **50** blockchain engineers, the largest in Europe (started in 2017). I have an excellent track record in attracting top-quality researchers, 5 of my former team members have obtained faculty positions, others work at Google, Intel, Spotify, Bank of Scotland, etc.

Publications Highlights

- Pim Otte, Martijn de Vos, Johan Pouwelse, "TrustChain: A **Sybil-resistant** scalable blockchain". In Future Generation Computer Systems Journal, Elsevier, 2020.
Our scientific breakthrough with a reusable mechanism to create trust between strangers. This mechanism has been used to induce online cooperation with over 80,000 real Internet users.
- Johan Pouwelse, Andr de Kok, Joost Fleuren, Peter Hoogendoorn, Raynor Vliegendhart, Martijn de Vos, "Laws for Creating Trust in the Blockchain Age". In European Property Law Journal, Volume 6, Issue 3, Pages 321356, ISSN (Online) 2190-8362, ISSN (Print) 2190-8273, 2017.
Presents a detailed roadmap for coming decade of blockchain research. Together with representatives of government ministries, chamber of commerce, and head of cybersecurity at a bank we present detailed plans to put the majority of economic activity of the Dutch economy "on the blockchain".
- R. Rahman, T. Vink, D. Hales, J. Pouwelse, H. Sips, "Design Space Analysis for Modeling Incentives in Distributed Systems". In **ACM SIGCOMM** 2011.
Incentives are key for trust-inducing mechanisms, we explore the design space of incentives automatically and demonstrate the effectiveness of this in real experiments. Published at a Tier-1 conference.
- J. Pouwelse, P. Garbacki, J. Wang, A. Bakker, J. Yang, A. Iosup, D. Epema, M. Reinders, M. van Steen, H. Sips, "Tribler: A Social-Based Peer-to-Peer System". In Concurrency and Computation Journal, Wiley, 2007 (623 citations)
Presents the realisation of an academically-pure distributed system. Our social media system is fully self-organising and lacks any single-point-of-failure. This online community still forms the foundation for our current Blockchain research and Trustchain.
- J.A. Pouwelse, P. Garbacki, D.H.J. Epema, H.J. Sips, "The Bittorrent P2P File-sharing System: Measurements and Analysis". In 4th International Workshop on Peer-to-Peer Systems (IPTPS'05), February 2005 (**1112 citations**)
*Presents the results of my 2-year long measurement of the Bittorrent community. Provided me with **datasets on trust-inducing mechanisms**, cooperation levels, spam intensity, moderator activity, trolling & attacks, and community dynamics in general.*
- J. Pouwelse, K. Langendoen, H. Sips, "Dynamic voltage scaling on a low-power microprocessor". In ACM Mobile Computing Conference (**MOBICOM**), Jul 2001 (10.7 % acceptance rate, 499 citations)
*Presents the first realisation of live voltage scaling on general-purpose systems. This has grown into key enabling technology for the smartphone revolution and proves my ability to engineer breakthrough technology. **My Linux kernel implementation**⁹ evolved over the years, but it is still included in all smartphones sold today.*
- Quinten Stokkink, Johan Pouwelse, "Deployment of a Blockchain-Based Self-Sovereign Identity", In IEEE International Conference On Blockchain, 2018.
Joint work with our government and biometric-authentication provider IDEMIA to create the first operational electronic passport using Trustchain and the "self-sovereign identity" principle.
- Kelong Kong, Zhijie Ren, Johan Pouwelse, "A Blockchain Consensus Protocol With **Horizontal Scalability**". In IFIP Networking Conference 2018.
- Martijn de Vos, Johan Pouwelse, "Real-time Money Routing by **Trusting Strangers** with your Funds". In IFIP Networking Conference 2018.

⁸<https://www.tudelft.nl/delft-blockchain-lab/education/>

⁹<https://www.kernel.org/doc/ols/2002/ols2002-pages-376-382.pdf>

My scientific work has been featured in international newspapers, magazines, specialist venues and on high-profile websites (e.g. BBC News, New York Times). See overview Table. We are deliberately limiting exposure to our recent blockchain work. My lab obtained the government contract to experiment with a blockchain-based identity system. Technology for cross-border travel requires a more conservative media strategy than our past work.

Local Dutch newspapers and websites		
Trouw	<i>Onderzoekers van de TU Delft willen het internet openbreken</i> ¹⁰	(2020)
RvIG Magazine	<i>De mens centraal bij Self Sovereign Identity</i> ¹¹	(2020)
Financieel Dagblad	<i>Overheid lanceert paspoort op het mobieltje</i> ¹²	(2019)
Emerce	<i>Nederland krijgt een app voor identiteitsbewijs</i> ¹³	(2019)
Volkskrant	<i>Bitcoins zijn passé</i> ¹⁴	(2018)
NRC Handelsblad	<i>Krijgen we ons ID op de smartphone?</i> ¹⁵	(2018)
NU.nl	<i>Utrecht en Eindhoven gaan digitale identiteitskaart testen</i> ¹⁶	(2018)
Elsevier	<i>Johan Pouwelse: Mijn ideaal is: mensen aan de macht</i> ¹⁷	(2014)
NRC Handelsblad	<i>Piraten zijn digitale pioniers</i> ¹⁸	(2009)
International newspapers and websites		
European Commission	<i>TU Delft helps develop digital ID for use on your phone</i> ¹⁹	(2018)
The Economist:	<i>The bigger picture</i> ²⁰	(2010)
The New York Times:	<i>BBC and P2P Next Test HD BitTorrent Streaming</i> ²¹	(2009)
Wall Street Journal:	<i>Will All of Us Get Our 15 Minutes On a YouTube Video</i> ²²	(2006)
BBC News:	<i>Net TV technology seeks testers</i> ²³	(2008)
	<i>File-sharers forced to play fair</i> ²⁴	(2007)
	<i>File-swappers ready new network</i> ²⁵	(2005)
Specialist venues		
IEEE Spectrum:	<i>Europe Looks for a Peer-to-Peer TV Alternative</i> ²⁶	(2008)
Harvard Gazette:	<i>Creating a computer currency</i> ²⁷	(2007)

¹⁰<https://www.trouw.nl/nieuws/onderzoekers-van-de-tu-delft-willen-het-internet-openbreken-het-kapitalisme-faalt-op-internet~bfae9e91>

¹¹<https://magazines.rvig.nl/idee/2020/13/de-mens-centraal-bij-self-sovereign-identity>

¹²<https://fd.nl/ondernemen/1306756/overheid-lanceert-paspoort-op-het-mobieltje>

¹³<https://www.emerce.nl/nieuws/nederland-krijgt-app-identiteitsbewijs>

¹⁴<https://www.volkskrant.nl/es-b4c854ff>

¹⁵<https://www.nrc.nl/nieuws/2018/07/14/krijgen-we-ons-id-op-de-smartphone-a1610028>

¹⁶<https://www.nu.nl/internet/5304425/utrecht-en-eindhoven-gaan-digitale-identiteitskaart-testen.html>

¹⁷<https://www.ewmagazine.nl/economie/blog/2014/12/johan-pouwelse-tribler-mijn-ideaal-is-mensen-aan-de-macht-1674399W/>

¹⁸<https://www.nrc.nl/nieuws/2009/04/17/piraten-zijn-digitale-pioniers-11713637-a637416>

¹⁹<https://ec.europa.eu/digital-single-market/en/news/tu-delft-helps-develop-digital-id-use-your-phone>

²⁰<http://www.economist.com/node/15582215>

²¹<http://www.nytimes.com/external/gigaom/2009/12/05/05gigaom-bbc-and-p2p-next-test-hd-bittorrent-streaming-49840.html>

²²<http://online.wsj.com/article/SB115689298168048904.html>

²³<http://news.bbc.co.uk/2/hi/technology/7517114.stm>

²⁴<http://news.bbc.co.uk/2/hi/technology/6971904.stm>

²⁵<http://news.bbc.co.uk/2/hi/technology/4149647.stm>

²⁶<http://spectrum.ieee.org/computing/software/europe-looks-for-a-peertopeer-tv-alternative>

²⁷<http://news.harvard.edu/gazette/story/2007/08/creating-a-computer-currency/>