

Statement of joint contributions

In the following, we state our contribution as co-authors in the following publications included in Ville Hautamäki's PdD thesis:

- P1.** P. Fränti, O. Virmajoki and V. Hautamäki, "Fast agglomerative clustering using a k -nearest neighbor graph". *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 28 (11), 1875-1881, November 2006.
- P2.** V. Hautamäki, I. Kärkkäinen and P. Fränti, "Outlier detection using k -nearest neighbour graph", *IAPR Int. Conf. on Pattern Recognition (ICPR'04)*, Cambridge, UK, vol. 3, 430-433, August 2004.
- P3.** V. Hautamäki, S. Cherednichenko, I. Kärkkäinen, T. Kinnunen and P. Fränti, "Improving k -means by outlier removal", *Scandinavian Conf. on Image Analysis (SCIA'05)*, Joensuu, Finland, LNCS vol. 3540, 978-987, June 2005.
- P4.** V. Hautamäki, T. Kinnunen, I. Kärkkäinen, J. Saastamoinen, M. Tuononen and P. Fränti, "Maximum a posteriori adaptation of the centroid model for speaker verification", *IEEE Signal Processing Letters*, 15, 162-165, 2008.
- P5.** V. Hautamäki, T. Kinnunen and P. Fränti, "Text-independent speaker recognition using graph matching", *Pattern Recognition Letters*, 29 (9), 1427-1432, 2008.
- P6.** T. Kinnunen, V. Hautamäki and P. Fränti, "On the use of long-term average spectrum in automatic speaker recognition", *Int. Symp. on Chinese Spoken Language Processing (ISCSLP'06)*, Singapore, Companion volume, 559-567, December 2006.
- P7.** V. Hautamäki, M. Tuononen, T. Niemi-Laitinen and P. Fränti, "Improving speaker verification by periodicity based voice activity detection", *Int. Conf. on Speech and Computer (SPECOM'07)*, Moscow, Russia, vol. 2, 645-650, October 2007.

In all articles, the proposed methods are results of team work with joint efforts by all authors. The order of authors indicates the contribution in preparing the papers, and the first author has been the principle author responsible for editing the text. In all cases, Ville Hautamäki's contribution has been independent and significant. Detailed contributions are described below.

In **P1**, Ville Hautamäki implemented and tested the first version, and wrote the very first draft of the paper. Olli Virmajoki then implemented the double-link version, and most of the graph creation algorithms. Olli also carried out most of the experiments. Pasi Fränti was responsible for writing the paper.

In **P2**, Ville Hautamäki is the sole responsible of the paper starting from the invention of the idea, implementation, experimenting and writing the paper. Ismo Kärkkäinen contributed in proof-reading the text, and preparing some of the illustrations. Pasi Fränti's role was mainly that of a supervisor guiding the work throughout the process, and by proof-reading the text.

In **P3**, the idea was originally proposed by Tomi Kinnunen. The first variant was implemented by Svetlana Cherednichenko in her MSc thesis, later revised by Ismo Kärkkäinen and Ville Hautamäki, who then took the principle role of the paper. Ville was also the main contributor in the algorithmic development, implementation and running the experiments. Ismo Kärkkäinen supported in the implementation, and performed some of the experiments and illustrations. Tomi wrote the introduction, the rest was written by Ville. Pasi Fränti's role was that of a supervisor throughout the work. Essentially the paper was a result of team work where Ville's role was most significant.

In **P4**, the idea was originally formulated by Juhani Saastamoinen, and Ismo Kärkkäinen implemented the first version showing that the idea works but the adaptation needed to solve out properly. Ville then took the responsibility of the work, carried out the proper implementation, experiments and wrote the entire paper jointly with Tomi Kinnunen. Other authors contributed also during these stages but Ville's role was clearly significant and crucial for the success of the process.

Paper **P5** was jointly prepared by Ville Hautamäki and Tomi Kinnunen as a team work. The role of Pasi Fränti was that of a supervisor. Tomi wrote the introduction and Ville the rest of the paper with the support by the other authors. Ville prepared the illustrations and performed the VQ-UBM experiments. The GMM-UBM and fusion experiments were provided by Tomi.

In **P6**, Ville Hautamäki acted as the supervisor of a very early student project in the topic, performed later a new implementation jointly with Tomi Kinnunen, who then acted as the principle author in writing the paper. Ville performed most of the experiments for the paper.

In **P7**, the idea originated from Tuija Niemi-Laitinen, and Ville Hautamäki then carried out the implementation, most of the experiments, and was the principle author in writing the paper.

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