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Visual analytics for spatially resolved omics data at single cell resolution: methods & applications

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LIST OF PUBLICATIONS

Journal Publications

A. Somarakis, M. E. Ijsselsteijn, B. Kenkhuis, V. v. Unen, S. J. Luk, F. Koning, L. v. d. Weerd, N. F. C. C. d. Miranda, B. P. F. Lelieveldt, and T. Höllt, “Visual Analysis of Tissue Images at Cellular Level,” in *EuroVis 2021 - Dirk Bartz Prize*, The Eurographics Association, 2021. doi: 10.2312/evm.20211074

M. E. Ijsselsteijn*, A. Somarakis*, B. Lelieveldt, T. Höllt⁺, and N. F. de Miranda⁺, “Semi-automated background removal limits data loss and normalizes imaging mass cytometry data,” *Cytometry Part A*, vol. 99, no. 12, pp. 1187–1197, 2021. doi: 10.1002/cyto.a.24480

B. Kenkhuis*, A. Somarakis*, L. de Haan, O. Dzyubachyk, M. E. Ijsselsteijn, N. F. de Miranda, B. P. Lelieveldt, J. Dijkstra, W. M. van Roon-Mom, T. Höllt, and L. van der Weerd, “Iron loading is a prominent feature of activated microglia in alzheimer’s disease patients,” *Acta neuropathologica communications*, vol. 9, no. 1, pp. 1–15, 2021. doi: 10.1186/s40478-021-01126-5

A. Somarakis, M. E. Ijsselsteijn, S. J. Luk, B. Kenkhuis, N. F. C. C. de Miranda, B. P. F. Lelieveldt, and T. Höllt, “Visual cohort comparison for spatial single-cell omics-data,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 27, no. 2, pp. 733–743, 2021. doi: 10.1109/tvcg.2020.3030336

A. Somarakis, V. V. Unen, F. Koning, B. P. Lelieveldt, and T. Höllt, “ImaCytE: visual exploration of cellular microenvironments for imaging mass cytometry data,” *IEEE Transactions on Visualization and Computer Graphics*, vol. 27, no. 1, pp. 98–110, 2021. doi: 10.1109/tvcg.2019.2931299

Z. Abdulrahman, S. Santegoets, G. Sturm, P. Charoentong, M. Ijsselsteijn, A. Somarakis, T. Höllt, F. Finotello, Z. Trajanoski, S. v. Egmond, D. Mustafa, M. Welters, N. d. Miranda, and S. v. d. Burg, “35 Chemokine-driven spatial organization of immune cell microaggregates marks oropharyngeal squamous cell carcinomas containing tumor-specific T cells,” *Journal for ImmunoTherapy of Cancer*, vol. 9, no. Suppl 2, pp. A41–A41, 2021. doi: 10.1136/jitc-2021-SITC2021.035

B. Kenkhuis, A. Somarakis, L. R. Kleindouwel, W. M. van Roon-Mom, T. Höllt, and L. van der Weerd, “Co-expression patterns of microglia markers Iba1, TMEM119 and P2RY12 in Alzheimer’s disease,” *bioRxiv*, 2021. doi: 10.1101/2021.05.31.446375

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D. Lähnemann, J. Köster, E. Szczurek, D. J. McCarthy, S. C. Hicks, M. D. Robinson, C. A. Vallejos, K. R. Campbell, N. Beerenwinkel, A. Mahfouz, L. Pinello, P. Skums, A. Stamatakis, C. S. O. Attolini, S. Aparicio, J. Baaijens, M. Balvert, B. de Barbanson, A. Cappuccio, G. Corleone, B. E. Dutilh, M. Florescu, V. Guryev, R. Holmer, K. Jahn, T. J. Lobo, E. M. Keizer, I. Khatri, S. M. Kielbasa, J. O. Korb, A. M. Kozlov, T. H. Kuo, B. P. Lelieveldt, I. I. Mandoiu, J. C. Marioni, T. Marschall, F. Mölder, A. Niknejad, L. Raczkowski, M. Reinders, J. de Ridder, A. E. Saliba, **A. Somarakis**, O. Stegle, F. J. Theis, H. Yang, A. Zelikovsky, A. C. McHardy, B. J. Raphael, S. P. Shah, and A. Schönhuth, “Eleven grand challenges in single-cell data science,” *Genome Biology*, vol. 21, 2020. doi: 10.1186/s13059-020-1926-6

N. Li, V. van Unen, N. Guo, T. Abdelaal, **A. Somarakis**, J. Eggermont, A. Mahfouz, S. M. C. de Sousa Lopes, B. P. Lelieveldt, and F. Koning, “Early-life compartmentalization of immune cells in human fetal tissues revealed by high-dimensional mass cytometry,” *Frontiers in Immunology*, vol. 10, 2019. doi: 10.3389/fimmu.2019.01932

Awards

Third Prize for the Dirk Bartz Award for Visual Computing in Medicine 2021

Honorable mention for the Karl Heinz Höhne Award for Medical Visualization 2021

CURRICULUM VITÆ

Antonios Somarakis was born in Heraklion, Crete at the 11th of November in 1992. After graduating from the 2nd General High School of Heraklion, he studied Electrical and Computer Engineering in the National Technical University of Athens. In April 2016, he obtained his 5-year Diploma with a major in Signal Processing and minor in Biomedical Engineering. He conducted his Diploma Thesis on the compression of ECG signal in collaboration with Erasmus University Medical Center.

After his introduction to the Dutch Academia, he started his PhD project in February 2017 on the visual analytics for spatial omics data under the supervision of Boudewijn Lelieveldt and Thomas Höllt in Leiden University Medical Center (LUMC). During the PhD project, he focused, in close collaboration with clinical researchers from LUMC, on problems related to the analysis of highly multiplexed cellular images.

In parallel with his PhD work, he remained socially active being, among others, member of the Leo Leiden PhD association and TU Delft Ambassadors.

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