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# Bibliography

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*One's work may be finished someday, but one's education, never.*

— ALEXANDRE DUMAS, PÈRE (1802 - 1870)

- [1] M. D. Abràmoff, P. J. Magalhães, S. J. Ram, “Image processing with ImageJ”, *Biophotonics International*, vol. 11, no. 7, pp. 36–42, 2004.
- [2] F. Aguet, D. Van De Ville, M. Unser, “A maximum-likelihood formalism for sub-resolution axial localization of fluorescent nanoparticles”, *Optics Express*, vol. 13, pp. 10503–10522, 2005.
- [3] W. M. Ahmed, S. J. Leavesley, B. Rajwa, M. N. Ayyaz, A. Ghafoor, J. P. Robinson, “State of the art in information extraction and quantitative analysis for multimodality biomolecular imaging”, *Proceedings of the IEEE*, vol. 96, no. 3, pp. 512–531, 2008.
- [4] A. Akhmanova & C. C. Hoogenraad, “Microtubule plus-end-tracking proteins: Mechanisms and functions”, *Current Opinion in Cell Biology*, vol. 17, no. 1, pp. 47–54, 2005.
- [5] A. Akhmanova, C. C. Hoogenraad, K. Drabek, T. Stepanova, B. Dortland, T. Verkerk, W. Vermeulen, B. M. Burgering, C. I. de Zeeuw, F. Grosveld, N. Galjart, “Clasps are CLIP-115 and -170 associating proteins involved in the regional regulation of microtubule dynamics in motile fibroblasts”, *Cell*, vol. 104, no. 6, pp. 923–935, 2001.
- [6] A. Akhmanova & M. O. Steinmetz, “Tracking the ends: A dynamic protein network controls the fate of microtubule tips”, *Nature Reviews Molecular Cell Biology*, vol. 9, no. 4, pp. 309–322, 2008.
- [7] F. J. Anscombe, “The transformation of Poisson, binomial and negative-binomial data”, *Biometrika*, vol. 35, no. 3/4, pp. 246–254, 1948.
- [8] J. Apgar, Y. Tseng, E. Fedorov, M. B. Herwig, S. C. Almo, D. Wirtz, “Multiple-particle tracking measurements of heterogeneities in solutions of actin filaments and actin bundles”, *Biophysical Journal*, vol. 79, no. 2, pp. 1095–1106, 2000.
- [9] S. M. Arulampalam, S. Maskell, N. Gordon, T. Clapp, “A tutorial on particle filters for online nonlinear/non-Gaussian Bayesian tracking”, *IEEE Transactions on Signal Processing*, vol. 50, no. 2, pp. 174–188, 2002.
- [10] C. P. Bacher, M. Reichenzeller, C. Athale, H. Herrmann, R. Eils, “4-D single particle tracking of synthetic and proteinaceous microspheres reveals preferential movement of nuclear particles along chromatin-poor tracks”, *BMC Cell Biology*, vol. 5, no. 45, pp. 1–14, 2004.
- [11] Y. Bar-Shalom, X. R. Li, T. Kirubarajan, *Estimation with Applications to Tracking and Navigation*, Wiley, New York, 2001.
- [12] J. E. Bear, T. M. Svitkina, M. Krause, D. A. Schafer, J. J. Loureiro, G. A. Strasser, I. V. Maly, O. Y. Chaga, J. A. Cooper, G. G. Borisov, F. B. Gertler, “Antagonism between Ena/VASP proteins and actin filament capping regulates fibroblast motility”, *Cell*, vol. 109, no. 4, pp. 509–521, 2002.

- [13] C. B. Bergsma, G. J. Streekstra, A. W. M. Smeulders, E. M. M. Manders, “Velocity estimation of spots in three-dimensional confocal image sequences of living cells”, *Cytometry*, vol. 43, no. 4, pp. 261–272, 2001.
- [14] Peter Bieling, Liedewij Laan, Henry Schek, Laura E. Munteanu, Linda Sandblad, Marileen Dogterom, Damian Brunner, Thomas Surrey, “Reconstitution of a microtubule plus-end tracking system *in vitro*”, *Nature*, vol. 450, pp. 1100–1105, December 2007.
- [15] S. Blackman & R. Popoli, *Design and Analysis of Modern Tracking Systems*, Artech House, Norwood, MA, 1999.
- [16] Y. Boers & Driessen, “A particle-filter-based detection scheme”, *IEEE Signal Process Letters*, vol. 10, no. 10, pp. 300–302, 2003.
- [17] S. Bonneau, M. Dahan, L. D. Cohen, “Single quantum dot tracking based on perceptual grouping using minimal paths in a spatiotemporal volume”, *IEEE Transactions on Image Processing*, vol. 14, no. 9, pp. 1384–1395, 2005.
- [18] H. Bornfleth, P. Edelmann, D. Zink, T. Cremer, C. Cremer, “Quantitative motion analysis of subchromosomal foci in living cells using four-dimensional microscopy”, *Biophysical Journal*, vol. 77, pp. 2871–2886, 1999.
- [19] H. Bornfleth, K. Satzler, R. Eils, C. Cremer, “High-precision distance measurements and volume-conserving segmentation of objects near and below the resolution limit in three-dimensional confocal fluorescence microscopy”, *Journal of Microscopy*, vol. 189, no. 2, pp. 118–136, 1998.
- [20] E. J. Breen, G. H. Joss, K. L. Williams, “Locating objects of interest within biological images: The top hat box filter”, *Journal of Computer-Assisted Microscopy*, vol. 3, no. 2, pp. 97–102, 1991.
- [21] D. S. Bright & E. B. Steel, “Two-dimensional top hat filter for extracting spots and spheres from digital images”, *Journal of Microscopy*, vol. 146, no. 2, pp. 191–200, 1987.
- [22] J. C. Bulinski, D. J. Odde, B. J. Howell, T. D. Salmon, C. M. Waterman-Storer, “Rapid dynamics of the microtubule binding of ensconsin *in vivo*”, *Journal of Cell Science*, vol. 114, no. 21, pp. 3885–3897, 2001.
- [23] P. Y. Burgi, A. L. Yuille, N. M. Grzywacz, “Probabilistic motion estimation based on temporal coherence”, *Neural Computation*, vol. 12, no. 8, pp. 1839–1867, 2000.
- [24] M. B. Cannell, A. McMorland, C. Soeller, “Image enhancement by deconvolution”, in *Handbook of Biological Confocal Microscopy*, B. Pawley (ed.), Springer, New York, Ch. 25, pp. 488–500, 2006.
- [25] J. F. Canny, “A computational approach to edge detection”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 8, no. 6, pp. 679–698, 1986.
- [26] B. C. Carter, G. T. Shubeita, S. P. Gross, “Tracking single particles: A user-friendly quantitative evaluation”, *Physical Biology*, vol. 2, no. 1, pp. 60–72, 2005.
- [27] P. Carvalho, J. S. Tirnauer, D. Pellman, “Surfing on microtubule ends”, *Trends in Cell Biology*, vol. 13, no. 5, pp. 229–237, 2003.
- [28] N. Caudron, I. Arnal, E. Buhler, D. Job, O. Valiron, “Microtubule nucleation from stable tubulin oligomers”, *Journal of Biological Chemistry*, vol. 227, pp. 50973–50979, 2002.
- [29] D. P. Chakraborty, “Maximum likelihood analysis of free-response receiver operating characteristic (FROC) data”, *Medical Physics*, vol. 16, no. 4, pp. 561–568, 1989.
- [30] D. P. Chakraborty, “Free-response methodology: Alternate analysis and a new observer-performance experiment”, *Radiology*, vol. 174, pp. 873–881, 1990.
- [31] C. Chang, P. Ansari, A. Khokhar, “Efficient tracking of cyclic human motion by component motion”, *IEEE Signal Processing Letters*, vol. 11, no. 12, pp. 941–944, 2004.
- [32] M. K. Cheezum, W. F. Walker, W. H. Guilford, “Quantitative comparison of algorithms for tracking single fluorescent particles”, *Biophysical Journal*, vol. 81, no. 4, pp. 2378–2388, 2001.

- [33] D. Chetverikov & J. Verestói, “Feature point tracking for incomplete trajectories”, *Computing*, vol. 62, no. 4, pp. 321–338, 1999.
- [34] D. Comaniciu & P. Meer, “Mean shift: A robust approach toward feature space analysis”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 24, no. 5, pp. 603–619, 2002.
- [35] M. de Moraes Marim, Bo Zhang, J.-C. Olivo-Marin, C. Zimmer, “Improving single particle localization with an empirically calibrated Gaussian kernel”, in *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 1003–1006, 2008.
- [36] O. Debeir, P. Van Ham, R. Kiss, C. Decaestecker, “Tracking of migrating cells under phase-contrast video microscopy with combined mean-shift processes”, *IEEE Transactions on Medical Imaging*, vol. 24, no. 6, pp. 697–711, 2005.
- [37] A. Desai & T. J. Mitchison, “Microtubule polymerization dynamics”, *Annual Review of Cell and Developmental Biology*, vol. 13, pp. 83–117, 1997.
- [38] J. F. Dorn, G. Danuser, Y. Ge, “Computational processing and analysis of dynamic fluorescence image data”, *Methods in Cell Biology*, vol. 25, pp. 497–538, 2008.
- [39] A. Doucet, N. de Freitas, N. Gordon, *Sequential Monte Carlo Methods in Practice*, Springer-Verlag, Berlin, 2001.
- [40] A. Doucet, S. Godsill, C. Andrieu, “On sequential Monte Carlo sampling methods for Bayesian filtering”, *Statistics and Computing*, vol. 10, no. 3, pp. 197–208, 2000.
- [41] H. Driessen & Y. Boers, “An efficient particle filter for jump Markov nonlinear systems”, in *IEE Target Tracking: Algorithms and Applications*, pp. 19–22, 2004.
- [42] D. A. Drubin, A. M. Garakani, P. A. Silver, “Motion as a phenotype: The use of live-cell imaging and machine visual screening to characterize transcription-dependent chromosome dynamics”, *BMC Cell Biology*, vol. 7:19, 2006.
- [43] A. Dufour, V. Shinin, S. Tajbakhsh, N. Guillen-Aghion and J.-C. Olivo-Marin, C. Zimmer, “Segmenting and tracking fluorescent cells in dynamic 3-D microscopy with coupled active surfaces”, *IEEE Transactions on Image Processing*, vol. 14, no. 9, pp. 1396–1410, 2005.
- [44] O. Dzyubachyk, W. Niessen, E. Meijering, “Advanced level-set based multiple-cell segmentation and tracking in time-lapse fluorescence microscopy images”, in *IEEE International Symposium on Biomedical Imaging: From Nano to Macro*, pp. 185–188, 2008.
- [45] R. Eils & C. Athale, “Computational imaging in cell biology”, *Journal of Cell Biology*, vol. 161, no. 3, pp. 477–481, 2003.
- [46] P. Farla, R. Hersmus, J. Trapman, A. B. Houtsmuller, “Antiandrogens prevent stable DNA-binding of the androgen receptor”, *Journal of Cell Science*, vol. 118, no. 18, pp. 4187–4198, 2005.
- [47] M. A. T. Figueiredo & R. D. Nowak, “Wavelet-based image estimation: An empirical Bayes approach using Jeffrey’s noninformative prior”, *IEEE Transactions on Image Processing*, vol. 10, no. 9, pp. 1322–1331, 2001.
- [48] H. Flyvbjerg, T. E. Holy, S. Leibler, “Microtubule dynamics: Caps, catastrophes, and coupled hydrolysis”, *Physical Review E*, vol. 54, no. 5, pp. 5538–5560, 1996.
- [49] Y.S. Fong, C.A. Pomalaza, X.H. Wang, “Comparison study of nonlinear filters in image processing applications”, *Optical Engineering*, vol. 28, pp. 749–760, 1989.
- [50] Y. Freund & R. E. Schapire, “Experiments with a new boosting algorithm”, in *Proceedings of the 13th International Conference on Machine Learning*, pp. 148–156, 1996.
- [51] Y. Garini, B. J. Vermolen, I. T. Young, “From micro to nano: Recent advances in high-resolution microscopy”, *Current Opinion in Biotechnology*, vol. 16, no. 1, pp. 3–12, 2005.
- [52] A. Genovesio, T. Liedl, V. Emiliani, W. J. Parak, M. Coppey-Moisan, J.-C. Olivo-Marin, “Multiple particle tracking in 3-D+t microscopy: Method and application to the tracking of endocytosed quantum dots”, *IEEE Transactions on Image Processing*, vol. 15, no. 5, pp. 1062–1070, 2006.

- [53] D. Gerlich & J. Ellenberg, “4D imaging to assay complex dynamics in live specimens”, *Nature Cell Biology*, vol. 5, pp. S14–S19, 2003.
- [54] D. Gerlich, J. Mattes, R. Eils, “Quantitative motion analysis and visualization of cellular structures”, *Methods*, vol. 29, no. 1, pp. 3–13, 2003.
- [55] S. F. Gibson & F. Lanni, “Experimental test of an analytical model of aberration in an oil-immersion objective lens used in three-dimensional light microscopy”, *Journal of the Optical Society of America A: Optics and Image Science*, vol. 9, no. 1, pp. 154–166, 1992.
- [56] S. Godsill & J. Vermaak, “Variable rate particle filters for tracking applications”, in *Proceedings of the IEEE/SP 13th Workshop on Statistical Signal Processing*, pp. 1280–1285, 2005.
- [57] S.J. Godsill, J. Vermaak, K-F. Ng, J-F. Li, “Models and algorithms for tracking of manoeuvring objects using variable rate particle filters”, *Proceedings of the IEEE*, vol. 95, no. 5, pp. 925–952, 2007.
- [58] I. Grigoriev, D. Splinter, N. Keijzer, P. S. Wulf, J. Demmers, T. Ohtsuka, M. Modesti, I. V. Maly, F. Grosveld, C. C. Hoogenraad, A. Akhmanova, “Rab6 regulates transport and targeting of exocytotic carriers”, *Developmental Cell*, vol. 13, no. 2, pp. 305–314, 2007.
- [59] M. Gu, *Advanced Optical Imaging Theory*, Springer-Verlag, Berlin, 2000.
- [60] M. G. L. Gustafsson, “Extended resolution fluorescence microscopy”, *Current Opinion in Structural Biology*, vol. 9, no. 5, pp. 627–634, 1999.
- [61] N. M. Haan & S. J. Godsill, “A time-varying model for DNA Sequencing data submerged in correlated noise”, in *Proceedings of the IEEE Workshop on Statistical Signal Processing*, August 2001.
- [62] S. Hadjidemetriou, J. S. Duncan, D. Toomre, D. Tuck, “Automatic quantification of microtubule dynamics”, in *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 656–659, 2004.
- [63] S. W. Hell, M. Dyba, S. Jakobs, “Concepts for nanoscale resolution in fluorescence microscopy”, *Current Opinion in Neurobiology*, vol. 14, no. 5, pp. 599–609, 2004.
- [64] B. Hinz, W. Alt, C. Johnen, V. Herzog, H.-W. Kaiser, “Quantifying lamella dynamics of cultured cells by SACED, a new computer-assisted motion analysis”, *Experimental Cell Research*, vol. 251, no. 1, pp. 234–243, 1999.
- [65] T. J. Holmes, D. Biggs, A. Abu-Tarif, “Blind deconvolution”, in *Handbook of Biological Confocal Microscopy*, B. Pawley (ed.), Springer, New York, Ch. 24, pp. 468–487, 2006.
- [66] B. K. Horn, *Robot Vision*, MIT Press, 1986.
- [67] J. Howard & A. A. Hyman, “Dynamics and mechanics of the microtubule plus end”, *Nature*, vol. 422, no. 6933, pp. 753–758, 2003.
- [68] C. Hue, J.-P. Le Cadre, P.F. Perez, “Sequential Monte Carlo methods for multiple target tracking and data fusion”, *IEEE Transactions on Signal Processing*, vol. 50, no. 2, pp. 309–325, 2002.
- [69] S. Inoue, *Handbook of Optics*, McGraw-Hill, Inc., New York, 1995.
- [70] M. Isard & A. Blake, “CONDENSATION – Conditional density propagation for visual tracking”, *International Journal of Computer Vision*, vol. 29, no. 1, pp. 5–28, 1998.
- [71] K. Jaqaman, D. Loerke, M. Mettlen, H. Kuwata, S. Grinstein, S.L. Schmid, G. Danuser, “Robust single-particle tracking in live-cell time-lapse sequences”, *Nature Methods*, vol. 5, no. 8, pp. 695–702, 2008.
- [72] K. Jaqaman, D. Loerke, M. Mettlen, H. Kuwata, S. Grinstein, S. L. Schmid, G. Danuser, “Robust single-particle tracking in live-cell time-lapse sequences”, *Nature Methods*, vol. 5, no. 8, pp. 695–702, 2008.
- [73] S. Jiang, X. Zhou, T. Kirchhausen, S. T. C. Wong, “Detection of molecular particles in live cells via machine learning”, *Cytometry Part A*, vol. 71, no. 8, pp. 563–575, 2007.
- [74] S. Jiang, X. Zhou, T. Kirchhausen, S. T. C. Wong, “Tracking molecular particles in live cells using fuzzy rule-based system”, *Cytometry Part A*, vol. 71, no. 8, pp. 576–584, 2007.

- [75] Y. Kalaidzidis, "Intracellular objects tracking", *European Journal of Cell Biology*, vol. 86, no. 9, pp. 569–578, 2007.
- [76] Z. Khan, T. Balch, F. Dellaert, "MCMC-based particle filtering for tracking a variable number of interacting targets", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 27, no. 11, pp. 1805–1819, 2005.
- [77] M. Klaas, N. de Freitas, A. Doucet, "Toward Practical  $N^2$  Monte Carlo: The Marginal Particle Filter", in *Proceedings of the Annual Conference on Uncertainty in Artificial Intelligence*, pp. 308–331, 2005.
- [78] Y. Komarova, C. O. de Groot, I. Grigoriev, S. Montenegro Gouveia, E. L. Munteanu, J. M. Schober, S. Honnappa, R. M. Buey, C. C. Hoogenraad, M. Dogterom, G. G. Borisy, M. O. Steinmetz, A. Akhmanova, "Mammalian end binding proteins control persistent microtubule growth", *Journal of Cell Biology*, vol. 184, no. 5, pp. 691–706, 2009.
- [79] Y. Kosuge & T. Matsuzaki, "The optimum gate shape and threshold for target tracking", in *Proceedings of the SICE Annual Conference in Fukuji*, vol. 2, pp. 2152–2157, 2003.
- [80] G. Lansbergen & A. Akhmanova, "Microtubule plus end: A hub of cellular activities", *Traffic*, vol. 7, no. 5, pp. 499–507, 2006.
- [81] G. Lansbergen, I. Grigoriev, Y. Mimori-Kiyosue, T. Ohtsuka, S. Higa, I. Kitajima, J. Demmers, N. Galjart, A. B. Houtsmuller, F. Grosveld, A. Akhmanova, "CLASPs attach microtubule plus ends to the cell cortex through a complex with LL5 $\beta$ ", *Developmental Cell*, vol. 11, no. 1, pp. 21–32, 2006.
- [82] V. Levi, Q. Ruan, E. Gratton, "3-D particle tracking in a two-photon microscope: Application to the study of molecular dynamics in cells", *Biophysical Journal*, vol. 88, no. 4, pp. 2919–2928, 2005.
- [83] K. Li, E. Miller, L. Weiss, P. Campbell, T. Kanade, "Online tracking of migrating and proliferating cells imaged with phase-contrast microscopy", in *Proceedings of the Conference on Computer Vision and Pattern Recognition Workshop*, pp. 65–72, 2006.
- [84] X. R. Li & V. P. Jilkov, "Survey of maneuvering target tracking: Part I: Dynamic models", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 39, no. 4, pp. 1333–1364, 2003.
- [85] R. Lienhart & J. Maydt, "An extended set of Haar-like features for rapid object detection", in *Proceedings of the 2002 International Conference on Image Processing*, vol. 1, pp. I-900–I-903, 2002.
- [86] T. Lindeberg, "Feature detection with automatic scale selection", *International Journal of Computer Vision*, vol. 30, no. 2, pp. 79–116, 1998.
- [87] J. Lippincott-Schwartz, N. Altan-Bonnet, G. H. Patterson, "Photobleaching and photoactivation: Following protein dynamics in living cells", *Nature Cell Biology*, vol. 5, pp. S7–S13, 2003.
- [88] J. Lippincott-Schwartz & G. H. Patterson, "Development and use of fluorescent protein markers in living cells", *Science*, vol. 300, no. 5616, pp. 87–91, 2003.
- [89] J. MacCormick & A. Blake, "Probabilistic exclusion and partitioned sampling for multiple object tracking", *International Journal of Computer Vision*, vol. 39, no. 1, pp. 57–71, 2000.
- [90] R. P. S. Mahler, "Multitarget Bayes filtering via first-order multitarget moments", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 39, no. 4, pp. 1152–1178, 2003.
- [91] S. Mallat, *A Wavelet Tour of Signal Processing*, Academic Press, 1998.
- [92] S. B. Marston, I. D. C. Fraser, W. Bing, G. Roper, "A simple method for automatic tracking of actin filaments in the motility assay", *Journal of Muscle Research and Cell Motility*, vol. 17, no. 4, pp. 497–506, 1996.
- [93] G. J. McLachlan, *Discriminant Analysis and Statistical Pattern Recognition*, Wiley-Interscience, 2004.
- [94] E. Meijering, "MTrackJ: A Java program for manual object tracking", <http://www.imagescience.org/meijering/software/mtrackj/>, 2006.

- [95] E. Meijering, I. Smal, G. Danuser, "Tracking in molecular bioimaging", *IEEE Signal Processing Magazine*, vol. 23, no. 3, pp. 46–53, 2006.
- [96] E. Meijering, I. Smal, O. Dzyubachyk, J.-C. Olivo-Marin, "Time-lapse imaging", in *Microscope Image Processing*, Q. Wu, F. A. Merchant, K. R. Castleman (eds.), Elsevier Academic Press, Burlington, MA, pp. 401–440, 2008.
- [97] E. Meijering & G. van Cappellen, "Quantitative biological image analysis", in *Imaging Cellular and Molecular Biological Functions*, S. L. Shorte & F. Frischknecht (eds.), Springer-Verlag, Berlin, pp. 45–70, 2007.
- [98] Y. Mimori-Kiyosue, I. Grigoriev, G. Lansbergen, H. Sasaki, C. Matsui, F. Severin, N. Galjart, F. Grosveld, I. Vorobjev, S. Tsukita, A. Akhmanova, "CLASP1 and CLASP2 bind to EB1 and regulate microtubule plus-end dynamics at the cell cortex", *Journal of Cell Biology*, vol. 168, no. 1, pp. 141–153, 2005.
- [99] T. Mitchison & M. Kirschner, "Dynamic instability of microtubule growth", *Nature*, vol. 312, no. 5991, pp. 237–242, 1984.
- [100] A. Miyawaki, A. Sawano, T. Kogure, "Lighting up cells: Labelling proteins with fluorophores", *Nature Cell Biology*, vol. 5, pp. S1–S7, 2003.
- [101] E. L. Munteanu, *Dynamics and regulation at the tip: A high resolution view on microtubule assembly*, Ph.D. thesis, Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, 2008.
- [102] D. Murphy, *Fundamentals of Light Microscopy and Digital Imaging*, Wiley-Liss, New York, 2001.
- [103] B. Neumann, M. Held, U. Liebel, H. Erfle, P. Rogers, R. Pepperkok, J. Ellenberg, "High-throughput RNAi screening by time-lapse imaging of live human cells", *Nature Methods*, vol. 3, no. 5, pp. 385–390, 2006.
- [104] W. Ng, J. Li, S. Godsill, J. Vermaak, "A hybrid method for online joint detection and tracking for multiple targets", *IEEE Transactions on Aerospace and Electronic Systems*. in press.
- [105] W. Ng, J. Li, S. Godsill, J. Vermaak, "A hybrid approach for online joint detection and tracking for multiple targets", in *Proceedings of the 2005 IEEE Aerospace Conference*, pp. 2126–2141, 2005.
- [106] P. Niethammer, I. Kronja, S. Kandels-Lewis, S. Rybina, P. Bastiaens, E. Karsenti, "Discrete states of a protein interaction network govern interphase and mitotic microtubule dynamics", *PLoS Biology*, vol. 5, no. 2, p. e29, 2007.
- [107] E. Nogales, M. Whittaker, R.A. Milligan, K.H. Downing, "High-resolution model of the microtubule", *Cell*, vol. 96, pp. 79–88, 1999.
- [108] J.-C. Olivo-Marin, "Extraction of spots in biological images using multiscale products", *Pattern Recognition*, vol. 35, no. 9, pp. 1989–1996, 2002.
- [109] P. Pankajakshan, Bo Zhang, L. Blanc-Feraud, Z. Kam, J.-C. Olivo-Marin, J. Zerubia, "Blind deconvolution for diffraction-limited fluorescence microscopy", in *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 740–743, 2008.
- [110] M. Pantic & I. Patras, "Dynamics of facial expression: Recognition of facial actions and their temporal segments from face profile image sequences", *IEEE Transactions on Systems, Man, and Cybernetics, Part B*, vol. 36, no. 2, pp. 433–449, 2006.
- [111] C.P. Papageorgiou, M. Oren, T. Poggio, "A general framework for object detection", in *Proceedings of the 6th International Conference on Computer Vision*, pp. 555–562, 1998.
- [112] J. B. Pawley, *Handbook of Biological Confocal Microscopy*, 3rd ed., Springer, New York, 2006.
- [113] R. Pepperkok & J. Ellenberg, "High-throughput fluorescence microscopy for systems biology", *Nature Reviews Molecular Cell Biology*, vol. 7, no. 9, pp. 690–696, 2006.
- [114] F. Perez, G. S. Diamantopoulos, R. Stalder, T. E. Kreis, "CLIP-170 highlights growing microtubule ends in vivo", *Cell*, vol. 96, no. 4, pp. 517–527, 1999.

- [115] P. Perez, J. Vermaak, A. Blake, "Data fusion for visual tracking with particles", *Proceedings of the IEEE*, vol. 92, no. 3, pp. 495–513, 2004.
- [116] P. Perona & J. Malik, "Scale-space and edge detection using anisotropic diffusion", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 12, no. 7, pp. 629–639, 1990.
- [117] M. Piccardi, "Background subtraction techniques: A review", in *2004 IEEE International Conference on Systems, Man and Cybernetics*, vol. 4, pp. 3099–3104, 2004.
- [118] X. Qu, D. Wu, L. Mets, N. F. Scherer, "Nanometer-localized multiple single-molecule fluorescence microscopy", *PNAS*, vol. 101, no. 31, pp. 11298–11303, 2004.
- [119] G. Rabut & J. Ellenberg, "Automatic real-time three-dimensional cell tracking by fluorescence microscopy", *Journal of Microscopy*, vol. 216, no. 2, pp. 131–137, 2004.
- [120] T. Ragan, H. Huang, P. So, E. Gratton, "3D particle tracking on a two-photon microscope", *Journal of Fluorescence*, vol. 16, no. 3, pp. 325–336, 2006.
- [121] W. S. Rasband, "ImageJ: Image processing and analysis in Java", <http://rsb.info.nih.gov/ij/>.
- [122] N. Ray & S. T. Acton, "Motion gradient vector flow: An external force for tracking rolling leukocytes with shape and size constrained active contours", *IEEE Transactions on Medical Imaging*, vol. 23, no. 12, pp. 1466–1478, 2004.
- [123] B. Rieger, C. Molenaar, R. W. Dirks, L. J. van Vliet, "Alignment of the cell nucleus from labeled proteins only for 4D in vivo imaging", *Microscopy Research and Technique*, vol. 64, no. 2, pp. 142–150, 2004.
- [124] J. P. Rigaut & J. Vassy, "High-resolution three-dimensional images from confocal scanning laser microscopy. Quantitative study and mathematical correction of the effects from bleaching and fluorescence attenuation in depth", *Analytical and Quantitative Cytology and Histology*, vol. 13, no. 4, pp. 223–232, 1991.
- [125] B. D. Ripley, *Stochastic Simulation*, Wiley, New York, 1987.
- [126] B. Ristic, S. Arulampalam, N. Gordon, *Beyond the Kalman Filter: Particle Filters for Tracking Applications*, Artech House, Boston, 2004.
- [127] M. Saban, A. Altinok, A. Peck, C. Kenney, S. Feinstein, L. Wilson, K. Rose, B. S. Manjunath, "Automated tracking and modeling of microtubule dynamics", in *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 1032–1035, 2006.
- [128] D. Sage, F. R. Neumann, F. Hediger, S. M. Gasser, M. Unser, "Automatic tracking of individual fluorescence particles: Application to the study of chromosome dynamics", *IEEE Transactions on Image Processing*, vol. 14, no. 9, pp. 1372–1383, 2005.
- [129] P. Sarder & A. Nehorai, "Deconvolution Methods for 3-D Fluorescence Microscopy Images", *IEEE Signal Processing Magazine*, vol. 23, no. 3, pp. 32–45, May 2006.
- [130] Y. Sato, J. Chen, R.A. Zoroofi, N. Harada, S. Tamura, T. Shiga, "Automatic extraction and measurement of leukocyte motion in microvessels using spatiotemporal image analysis", *IEEE Transactions on Biomedical Engineering*, vol. 44, pp. 225–236, 1997.
- [131] M. J. Saxton & K. Jacobson, "Single-particle tracking: Applications to membrane dynamics", *Annual Review of Biophysics and Biomolecular Structure*, vol. 26, pp. 373–399, June 1997.
- [132] I. F. Sbalzarini & P. Koumoutsakos, "Feature point tracking and trajectory analysis for video imaging in cell biology", *Journal of Structural Biology*, vol. 151, no. 2, pp. 182–195, 2005.
- [133] M. Schaap, R. Manniesing, I. Smal, T. van Walsum, A. van der Lugt, W. J. Niessen, "Bayesian tracking of tubular structures and its application to carotid arteries in CTA", in *Proceedings of Medical Image Computing and Computer-Assisted Intervention*, pp. 562–570, 2007.
- [134] M. Schaap, I. Smal, C.T. Metz, T. van Walsum, W. J. Niessen, "Bayesian tracking of elongated structures in 3D images", in *Proceedings of Information Processing in Medical Imaging, 20th International Conference*, pp. 74–85, 2007.
- [135] D. A. Schiffmann, D. Dikovskaya, P. L. Appleton, I. P. Newton, D. A. Creager, C. Allan, I. S. Näthke, I. G. Goldberg, "Open microscopy environment and FindSpots: Integrating image informatics with quantitative multidimensional image analysis", *BioTechniques*, vol. 41, no. 2, pp. 199–208, 2006.

- [136] W. Schroeder, K. Martin, B. Lorensen, *The Visualization Toolkit: An Object-Oriented Approach to 3D Graphics*, 3rd ed., Kitware, New York, 2002.
- [137] S. C. Schuyler & D. Pellman, "Microtubule "plus-end-tracking proteins": The end is just the beginning", *Cell*, vol. 105, no. 4, pp. 421–424, 2001.
- [138] J. Serra, *Image Analysis and Mathematical Morphology*, Academic Press, London, 1982.
- [139] H. Shen, G. Nelson, S. Kennedy, D. Nelson, J. Johnson, D. Spiller, M. R. H. White, D. B. Kell, "Automatic tracking of biological cells and compartments using particle filters and active contours", *Chemometrics and Intelligent Laboratory Systems*, vol. 82, no. 1-2, pp. 276–282, 2006.
- [140] I. Smal, K. Draegestein, N. Galjart, W. Niessen, E. Meijering, "Rao-Blackwellized marginal particle filtering for multiple object tracking in molecular bioimaging", in *Proceedings of the International Conference on Information Processing in Medical Imaging*, pp. 110–121, 2007.
- [141] I. Smal, K. Draegestein, N. Galjart, W. Niessen, E. Meijering, "Particle filtering for multiple object tracking in dynamic fluorescence microscopy images: Application to microtubule growth analysis", *IEEE Transactions on Medical Imaging*, vol. 27, no. 6, pp. 789–804, 2008.
- [142] I. Smal, E. Meijering, K. Draegestein, N. Galjart, I. Grigoriev, A. Akhmanova, M. E. van Royen, A. B. Houtsmuller, W. Niessen, "Multiple object tracking in molecular bioimaging by Rao-Blackwellized marginal particle filtering", *Medical Image Analysis*, vol. 12, no. 6, pp. 764–777, 2008.
- [143] I. Smal, W. Niessen, E. Meijering, "Bayesian tracking for fluorescence microscopic imaging", in *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 550–553, 2006.
- [144] I. Smal, W. Niessen, E. Meijering, "Particle filtering for multiple object tracking in molecular cell biology", in *Proceedings of the Nonlinear Statistical Signal Processing Workshop*, pp. 44.1–44.4, 2006.
- [145] I. Smal, W. Niessen, E. Meijering, "Advanced particle filtering for multiple object tracking in dynamic fluorescence microscopy images", in *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 1048–1051, 2007.
- [146] I. Smal, W. Niessen, E. Meijering, "A new detection scheme for multiple object tracking in fluorescence microscopy by joint probabilistic data association filtering", in *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 264–267, 2008.
- [147] P. Soille, *Morphological Image Analysis: Principles and Applications*, Springer-Verlag, Berlin, 2003.
- [148] L. Song, E. J. Hennink, I. T. Young, H. J. Tanke, "Photobleaching kinetics of fluorescein in quantitative fluorescence microscopy", *Biophysical Journal*, vol. 68, no. 6, pp. 2588–2600, 1995.
- [149] M. Sonka, V. Hlavac, R. Boyle, *Image Processing, Analysis, and Machine Vision*, 2nd ed., PWS Publishing, Pacific Grove, 1999.
- [150] C. O. S. Sorzano, P. Thévenaz, M. Unser, "Elastic registration of biological images using vector-spline regularization", *IEEE Transactions on Biomedical Engineering*, vol. 52, no. 4, pp. 652–663, 2005.
- [151] J.-L. Starck, M. Elad, D.L. Donoho, "Redundant multiscale transforms and their application for morphological component analysis", in *Advances in Imaging and Electron Physics*, vol. 132, Elsevier Academic Press, San Diego, CA, pp. 288–348, 2004.
- [152] J.-L. Starck, J. Fadili, F. Murtagh, "The undecimated wavelet decomposition and its reconstruction", *IEEE Transactions on Image Processing*, vol. 16, no. 2, pp. 297–309, 2007.
- [153] J.-L. Starck & F. Murtagh, "Astronomical image and signal processing: looking at noise, information and scale", *IEEE Signal Processing Magazine*, vol. 18, no. 2, pp. 30–40, 2001.
- [154] J.-L. Starck & F. Murtagh, *Astronomical Image and Data Analysis*, Springer-Verlag, Berlin, 2002.



- [155] T. Stepanova, J. Slemmer, C. C. Hoogenraad, G. Lansbergen, B. Dortland, C. I. de Zeeuw, F. Grosveld, G. van Cappellen, A. Akhmanova, N. Galjart, "Visualization of microtubule growth in cultured neurons via the use of EB3-GFP (end-binding protein 3-green fluorescent protein)", *Journal of Neuroscience*, vol. 23, no. 7, pp. 2655–2664, 2003.
- [156] D. J. Stephens & V. J. Allan, "Light microscopy techniques for live cell imaging", *Science*, vol. 300, no. 5616, pp. 82–86, 2003.
- [157] S. R. Sternberg, "Biomedical image processing", *Computer*, vol. 16, no. 1, pp. 22–34, 1983.
- [158] J. Suh, M. Dawson, J. Hanes, "Real-time multiple-particle tracking: Application to drug and gene delivery", *Advanced Drug Delivery Reviews*, vol. 57, no. 1, pp. 63–78, 2005.
- [159] B. M. ter Haar Romeny, *Front-End Vision and Multi-Scale Image Analysis*, Springer, Berlin, 2003.
- [160] D. Thomann, J. Dorn, P. K. Sorger, G. Danuser, "Automatic fluorescent tag localization II: Improvement in super-resolution by relative tracking", *Journal of Microscopy*, vol. 211, no. 3, pp. 230–248, 2003.
- [161] D. Thomann, D. R. Rines, P. K. Sorger, G. Danuser, "Automatic fluorescent tag detection in 3D with super-resolution: Application to the analysis of chromosome movement", *Journal of Microscopy*, vol. 208, no. 1, pp. 49–64, 2002.
- [162] R. E. Thompson, D. R. Larsonand, W. W. Webb, "Precise nanometer localization analysis for individual fluorescent probes", *Biophysical Journal*, vol. 82, pp. 2775–2783, 2002.
- [163] C. Tomasi & R. Manduchi, "Bilateral filtering for gray and color images", in *Proceedings of the Sixth International Conference on Computer Vision*, pp. 839–846, 1998.
- [164] R. Y. Tsien, "Imagining imaging's future", *Nature Cell Biology*, vol. 5, pp. S16–S21, 2003.
- [165] G. L. Turin, "An introduction to matched filters", *IRE Transactions on Information Theory*, vol. 6, no. 3, pp. 311–329, 1960.
- [166] W. Tvaruskó, M. Bentele, T. Misteli, R. Rudolf, C. Kaether, D. L. Spector, H. H. Gerdes, R. Eils, "Time-resolved analysis and visualization of dynamic processes in living cells", *Proceedings of the National Academy of Sciences of the United States of America*, vol. 96, no. 14, pp. 7950–7955, 1999.
- [167] D. Uttenweiler, C. Veigel, R. Steubing, C. Götz, S. Mann, H. Haussecker, B. Jähne, R. H. A. Fink, "Motion determination in actin filament fluorescence images with a spatio-temporal orientation analysis method", *Biophysical Journal*, vol. 78, no. 5, pp. 2709–2715, 2000.
- [168] D. Uttenweiler, C. Weber, B. Jähne, R. H. Fink, H. Scharr, "Spatiotemporal anisotropic diffusion filtering to improve signal-to-noise ratios and object restoration in fluorescence microscopic image sequences", *Journal of Biomedical Optics*, vol. 8, no. 1, pp. 40–47, 2003.
- [169] P. Valloiton, A. Ponti, C. M. Waterman-Storer, E. D. Salmon, G. Danuser, "Recovery, visualization, and analysis of actin and tubulin polymer flow in live cells: A fluorescent speckle microscopy study", *Biophysical Journal*, vol. 85, no. 2, pp. 1289–1306, 2003.
- [170] M. E. Van Royen, S. M. Cunha, M. C. Brink, K. A. Mattern, A. L. Nigg, H. J. Dubbink, P. J. Verschure, J. Trapman, A. B. Houtsmuller, "Compartmentalization of androgen receptor protein-protein interactions in living cells", *Journal of Cell Biology*, vol. 177, no. 1, pp. 63–72, 2007.
- [171] C. J. Veenman, M. J. T. Reinders, E. Backer, "Motion tracking as a constrained optimization problem", *Pattern Recognition*, vol. 36, no. 9, pp. 2049–2067, 2003.
- [172] F. Verde, M. Dogterom, E. Stelzer, E. Karsenti, S. Leibler, "Control of microtubule dynamics and length by cyclin A- and cyclin B-dependent kinases in *Xenopus* egg extracts", *Journal of Cell Biology*, vol. 118, no. 5, pp. 1097–1108, 1992.
- [173] F. Verde, J. C. Labbe, M. Doree, E. Karsenti, "Regulation of microtubule dynamics by cdc2 protein kinase in cell-free extracts of *Xenopus* eggs", *Nature*, vol. 343, no. 6255, pp. 233–238, 1990.
- [174] J. Vermaak, A. Doucet, P. Pérez, "Maintaining multi-modality through mixture tracking", in *Proceedings of the IEEE International Conference on Computer Vision*, pp. 1110–1116, 2003.

- [175] J. Vermaak, N. Ikoma, S. J. Godsill, “Extended object tracking using particle techniques”, in *Proceedings of the IEEE Aerospace Conference*, vol. 3, pp. 1876–1885, 2004.
- [176] B. J. Vermolen, Y. Garini, I. T. Young, R. W. Dirks, V. Raz, “Segmentation and analysis of the three-dimensional redistribution of nuclear components in human mesenchymal stem cells”, *Cytometry Part A*, vol. 73, no. 9, pp. 816–824, 2008.
- [177] L. Vincent, “Morphological grayscale reconstruction in image analysis: Applications and efficient algorithms”, *IEEE Transactions on Image Processing*, vol. 2, no. 2, pp. 176–201, 1993.
- [178] P. Viola & M. Jones, “Rapid object detection using a boosted cascade of simple features”, in *Proceedings of the 2001 IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, vol. 1, pp. I-511–I-518, 2001.
- [179] L.J. Van Vliet, D. Sudar, I. T. Young, “Digital fluorescence imaging using cooled charge-coupled device array cameras”, in *Cell Biology: a Laboratory Handbook*, K. Simons (ed.), 2nd. ed., Academic Press, New York, pp. 109–120, 1998.
- [180] C. Vonesch, F. Aguet, J.-L. Vonesch, M. Unser, “The colored revolution of bioimaging”, *IEEE Signal Processing Magazine*, vol. 23, no. 3, pp. 20–31, 2006.
- [181] T. Voorn-Brouwer, A. Kragt, H.F. Tabak, B. Distel, “Peroxisomal membrane proteins are properly targeted to peroxisomes in the absence of COPI- and COPII-mediated vesicular transport”, *Journal of Cell Science*, vol. 114, no. 11, pp. 2199–2204, 2001.
- [182] R.A. Walker, E.T. O’Brien, N.K. Pryer, M.F. Soboeiro, W.A. Voter, H.P. Erickson, E.D. Salmo, “Dynamic instability of individual microtubules analyzed by video light microscopy: rate constants and transition frequencies”, *Journal of Cell Biology*, vol. 107, pp. 1437–1448, 1988.
- [183] Q. Wen, J. Gao, A. Kosaka, H. Iwaki, K. Luby-Phelps, D. Mundy, “A particle filter framework using optimal importance function for protein molecules tracking”, in *Proceedings of the IEEE International Conference on Image Processing*, vol. 1, pp. 1161–1164, 2005.
- [184] J. Wolf, W. Burgard, H. Burkhardt, “Robust vision-based localization by combining an image-retrieval system with Monte Carlo localization”, *IEEE Transactions on Robotics*, vol. 21, no. 2, pp. 208–216, 2005.
- [185] Q. Wu, F. A. Merchant, K. R. Castleman, *Microscope Image Processing*, Elsevier Academic Press, Burlington, MA, 2008.
- [186] Y. Wu, J. Lin, T. S. Huang, “Analyzing and capturing articulated hand motion in image sequences”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 27, no. 12, pp. 1910–1922, 2005.
- [187] K. Yin Kong, A. I. Marcus, J. Young Hong, P. Giannakakou, M. D. Wang, “Computer assisted analysis of microtubule dynamics in living cells”, in *Proceedings of the 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, pp. 3982–3985, 2005.
- [188] I. Zaliapin, A. Gabriellov, V. Keilis-Borok, “Multiscale trend analysis”, *Fractals*, vol. 12, no. 3, pp. 275–292, 2004.
- [189] I. Zaliapin, I. Semenova, A. Kashina, V. Rodionov, “Multiscale trend analysis of microtubule transport in melanophores”, *Biophysical Journal*, vol. 88, pp. 4008–4016, 2005.
- [190] B. Zhang, J. Zerubia, J.-C. Olivo-Marin, “Gaussian approximations of fluorescence microscope point-spread function models”, *Applied Optics*, vol. 46, no. 10, pp. 1819–1829, 2007.
- [191] X. Zhou & S. T. C. Wong, “Informatics challenges of high-throughput microscopy”, *IEEE Signal Processing Magazine*, vol. 23, no. 3, pp. 63–72, 2006.
- [192] C. Zimmer, E. Labrüyère, V. Meas-Yedid, N. Guillén, J.-C. Olivo-Marin, “Segmentation and tracking of migrating cells in videomicroscopy with parametric active contours: a tool for cell-based drug testing”, *IEEE Transactions on Medical Imaging*, vol. 21, no. 10, pp. 1212–1221, 2002.