Trevor Jackson Darrell
748 Sutardja Dai Hall, UC Berkeley CA 94720
trevor@eecs.berkeley.edu

I. Education:

School	Degree	Date
University of Pennsylvania.	B.S.E	1988
MIT	MS	1991
MIT	Ph.D.	1996

II. Experience:

Employer	Position	Beginning	Ending
Univ. of Pennsylvania	Sys. Prog./Administrator	1985	1988
Cold Spring Harbor Lab	Teaching Assistant	1994	1994
Stanford University	Visiting Researcher	1994	1994
Stanford University	Visiting Instructor	1997	1997
Interval Research Corp.	Research Staff	1996	1999
MIT	Assistant Professor	1999	2003
MIT	Associate Professor	2003	2008
ICSI	Group Leader	2008	2014
UC Berkeley CS	Associate Adj. Professor	2008	2011
UC Berkeley CS	Professor-in-Residence	2011	present

III. Professional Service:

Activity	Beginning	Ending
Conference on Computer Vision and Pattern Recognition (CVPR)		
Area Chair	2001, 2008, 2017, 2019, 2020, 2021, 2022	
Program Chair	2010	

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International Conference on Computer Vision (ICCV) Area Chair	2005, 2015	
International Conference on Multimodal Interfaces (ICMI)		
Program Committee	2000, 2002	
Advisory board member	2003	2011
Program Chair	2003	
General Chair	2004	
Area Chair	2005, 2006	
European Conference on Computer Vision (ECCV) Area Chair	2016, 2018, 2022	
Intl. Conference on Machine Learning (ICML) Area Chair	2016. 2018	
Intl. Conference on Learning Representations (ICLR) Area Chair	2016, 2020	
Conference on Perceptual User Interfaces (PUI) Program Chair	2001	
Conference on Ubiquitous Computing (UBICOMP) Program Committee	2002	
NSF Panels (CISE, SBIR, HCI, ITR, CAREER, AI, NRI, …)	2002	present
DARPA Information Science and Technology Advisory Study Group (ISAT): Member	2003	2007
Member, Second Appointment	2011	2014
Future Command Study	2003	2004
Embedded Humans Study	2004	2005
Trusted Deployable Adaptive Systems Study	2005	2006
Data Taming Study	2005	2006
Co-Chair, Adaptive and Interactive Representations Quick Reaction Study	2006	
Chair, Exploitation of Persistent Operational Surveillance (EXPOSE) Study	2007	2008
Chair, TACT Study	2012	2013
Chair, TRUST Study	2013	2014
Neural Information Processing Systems (NIPS) Conference: Senior Program Committee / Area Chair	2004	
Senior Area Chair	2018	
Editor, *CACM Special Issue on Perceptive Multimodal Interfaces*	2004	
AAAI conference; Program Committee, 2004	2004	
Associate Editor, *Artificial Intelligence Journal*	2004	2011
Associate Editor, *IEEE Trans. Pattern Analysis and Machine Intelligence*	2005	2011
Second term	2015	2017
DARPA Computer Sciences Futures Study (Junior Faculty), Member	2006	

IV. Honors and Awards

Outstanding paper award, International Conference on Multimodal Interfaces, 2005

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Outstanding paper award, International Conference on Multimodal Interfaces, 2006

Best paper award, Internet Vision Workshop, 2008

Keynote Speaker, ACM Intelligent User Interfaces Conference: "Image Recognition Interfaces," February 2009.

Best Cognitive Robotics Paper Award, International Conference on Robotics and Automation 2013

Best Open Source Software Award, ACM Multimedia 2014

Best Paper Honorable Mention, Computer Vision and Pattern Recognition 2015

Best Paper, North American Association for Computational Linguistics, 2016

Everingham Award, ICCV 2017

V. Postdocs

Current

Name	Dates of Appointment	PhD Granting Institution	Curr. Position
David Chan	2024-	UCB	Postdoct.

Previous

Name	Title	Employer	Position
Konrad Tollmar	Postdoctoral Lecturer	Lund University	Assoc. Prof.
David Demirdjian	Postdoctoral Researcher	Toyota Research	Research Sci.
Raquel Urtasun	Postdoctoral Researcher	TTI-C	Asst. Prof.
Mario Fritz	Postdoctoral Researcher	MPI	Junior Prof.
Mathieu Salsmann	Postdoctoral Researcher	TTI-C	Asst. Prof.
Mario Christoudias	Postdoctoral Researcher	EPFL	Postdoc
Brian Kulis	Postdoctoral Researcher	Ohio State University	Asst. Prof.
Kate Saenko	Postdoctoral Researcher	B.U.	Assoc. Prof.
Sergio Guadarrama	Postdoctoral Researcher	Google	Research Engineer
Daniel Goehring	Postdoctoral Researcher	HU Berlin	Asst. Prof
Lorenzo Riano	Postdoctoral Researcher	Bosch NA	Sr. Research Eng.
Jiashi Feng	Postdoctoral Researcher	NUS	Asst. Prof

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Stefanie Jegelka	Postdoctoral Researcher	MIT	Asst. Prof
Marcus Rohrbach	Postdoctoral Researcher	FAIR	Research Sci.
Ryan Ferrell	Postdoctoral Researcher	BYU	Asst. Prof.
Ross Girshick	Postdoctoral Researcher	FAIR	Research Sci.
Philipp Krahenbuhl	Postdoctoral Researcher	UT Austin	Asst. Prof.
Oscar Beijiboom	Postdoctoral Researcher	Startup	CTO
Zeynep Akata	Postdoctoral Researcher	U. Amsterdam	Asst. Prof.
Fisher Yu	Postdoctoral Researcher	ETHZ	Asst. Prof.
Huijuan Xu	Postdoctoral Researcher	Penn State	Asst. Prof.
Anna Rohrbach	Postdoc & Rsrch. Sci.	TU Darmstadt	Prof.
Angjoo Kanazawa	Postdoctoral Researcher	UCB	Asst. Prof.
Xihui Liu	Postdoctoral Researcher	Hong Kong University	Asst. Prof.
Roi Herzig	Postdoctoral Researcher	IBM	Research Scientist

VI. Students

2005	Gregory Shakhnarovich	MIT EECS	Doctor of Philosophy	Learning Features for Visual Classification
2005	Ali Rahimi	MIT EECS	Doctor of Philosophy	Learning to Transform Time Series with a Few Examples, Oct. 2005
2006	Louis-Philippe Morency	MIT EECS	Doctor of Philosophy	Dialogue Context and Visual Gesture Recognition

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2006	Kevin Wilson	MIT EECS	Doctor of Philosophy	Learning Uncertainty Models for Audiovisual Speech Source Localization in Real-World Environments
2006	Kristen Grauman	MIT EECS	Doctor of Philosophy	Matching sets of features for efficient retrieval and recognition,
2006	Leonid Taycher	MIT EECS	Doctor of Philosophy	Statistical methods for dynamic visual processing
2008	Sy Bor Wang	MIT EECS	Doctor of Philosophy	Communication Error Detection Using Facial Expressions
2009	Kate Saenko	MIT EECS	Doctor of Philosophy	Image Sense Disambiguation: A Multimodal Approach
2009	Tom Yeh	MIT EECS	Doctor of Philosophy	Interacting with Computers using Images for Search and Automation
2009	Mario Christhoudias	MIT EECs	Doctor of Philosophy	Probabilistic Models for Semi-Supervised

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				Learning and Coding
2009	Ariadna Quattoni	MIT EECS	Doctor of Philosophy	Transfer Learning Algorithms for Image Classification
2010	Ashley Eden	Computer Science PhD	Doctor of Philosophy	Finding Lost Children
2014	Sergey K. Karayev	Computer Science PhD	Doctor of Philosophy	Anytime Recognition of Objects and Scenes
2014	Hyun Oh Song	Computer Science PhD	Doctor of Philosophy	Learning with Parsimony for Large Scale Object Detection and Discovery
2014	Yangqing Jia	Computer Science PhD	Doctor of Philosophy	
2015	Ning Zhang	Computer Science PhD	Doctor of Philosophy	Visual Representations for Fine-grained Categorization

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2016	Judy Hoffman	EECS	Doctor of Philosophy	Adaptive Learning Algorithms for Transferable Visual Recognition
2016	Judith F. Hoffman	Electrical Eng & Comp Sci PhD	Doctor of Philosophy	Adaptive Learning Algorithms for Transferable Visual Recognition
2016	Jonathan L. Long	Computer Science PhD	Doctor of Philosophy	Understanding and Designing Convolutional Networks for Local Recognition Problems
2017	Jeffrey D. Donahue	Computer Science PhD	Doctor of Philosophy	Transferrable Representations for Visual Recognition
2017	Deepak Pathak	EECS	Doctor of Philosophy	
2018	Chelsea B. Finn	EECS	Doctor of Philosophy	Learning to Learn with Gradients
2019	Yang Gao	Computer Science PhD	Doctor of Philosophy	End to End Learning in Autonomous Driving Systems

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2019	Deepak Pathak	Computer Science PhD	Doctor of Philosophy	Learning to Generalize via Self-Supervised Prediction
2019	Evan G. Shelhamer	Computer Science PhD	Doctor of Philosophy	Local and Adaptive Image-to-Image Learning and Inference
2019	Lisa Anne M. Hendricks	Electrical Eng & Comp Sci PhD	Doctor of Philosophy	Visual Understanding through Natural Language
2020	Coline Devin	Computer Science PhD	Doctor of Philosophy	Compositionality and Modularity for Robot Learning
2020	Eric S. Tzeng	Computer Science PhD	Doctor of Philosophy	Adapting Across Domains by Aligning Representations and Images
2020	Sayna Ebrahimi	Mechanical Engineering PhD	Doctor of Philosophy	Mechanical Behavior of Materials at Multiscale Peridynamic Theory and Learning-based Approaches

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2020	Ronghang Hu	Computer Science PhD	Doctor of Philosophy	Structured Models for Vision-and-Language Reasoning
2020	Xin Wang	Computer Science PhD	Doctor of Philosophy	The Design of Dynamic Neural Networks for Efficient Learning and Inference
2020	Samaneh Azadi	Computer Science PhD	Doctor of Philosophy	Visual Content Creation by Generative Adversarial Networks
2021	Vijay Govindarajan	Electrical Eng & Comp Sci PhD	Doctor of Philosophy	Adaptive Prediction and Planning for Safe and Effective Autonomous Vehicles
2021	Huazhe Xu	Computer Science PhD	Doctor of Philosophy	Learning Predictive Models for Efficient Policy Learning
2022	Zhuang Liu	Computer Science PhD	Doctor of Philosophy	Efficient and Scalable Neural Architectures for Visual Recognition

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2022	Dequan Wang	Computer Science PhD	Doctor of Philosophy	Learning to Generalize in Dynamic Environments
2022	Parsa Mahmoudieh	Computer Science PhD	Doctor of Philosophy	Multi-task Policy Learning with Minimal Human Supervision
2023	Shizhan Zhu	Computer Science PhD	Doctor of Philosophy	Implicit Modeling for 3D Applications
2023	Medhini Gulganjalli Narasimhan	Computer Science PhD	Doctor of Philosophy	Multimodal Long-Term Video Understanding
2023	Tete Xiao	Computer Science PhD	Doctor of Philosophy	Scalable Representations for Vision and Robotics
2023	Dong Huk S. Park	Computer Science PhD	Doctor of Philosophy	Vision and Language Understanding Through Generative Modeling
current	Xudong Wang	Electrical Eng & Comp Sci PhD	Doctor of Philosophy	

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current	Evonne Ng	Electrical Eng & Comp Sci PhD	Doctor of Philosophy	
current	Sheng Shen	Computer Science PhD	Doctor of Philosophy	
current	Marissa I. Ramirez de Chanlatte	Applied Science & Tech PhD	Doctor of Philosophy	
current	Olivia G. Watkins	Computer Science PhD	Doctor of Philosophy	
current	Suzie Petryk	Computer Science PhD	Doctor of Philosophy	

VII. Committee Service

2001-2006 MIT EECS Graduate Admissions

2002 MIT LCS and AI lab Merger Committee

2010-2017 UC EECS Graduate Admissions

2018-present UC EECS Graduate Matters

2021-2023 UC EECS External Relations

2023-present UC Berkeley COI

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VIII. Publications

Refereed Journal articles (through 2022; for updates see Google Scholar):

1. Darrell, T., & Wohn, K. (1990). Depth from focus using a pyramid architecture. Pattern Recognition Letters, 11(12), 787–796. http://doi.org/10.1016/0167-8655(90)90032-W

2. Pentland, A., Scherock, S., Darrell, T., & Girod, B. (1994). Simple range cameras based on focal error. Journal of the Optical Society of America A, 11(11), 2925. http://doi.org/10.1364/JOSAA.11.002925

3. Darrell, T., & Pentland, A. P. (1995). Cooperative robust estimation using layers of support. IEEE Transactions on Pattern Analysis and Machine Intelligence, 17(5), 474–487. http://doi.org/10.1109/34.391395

4. Johnson, M. P., Maes, P., & Darrell, T. (1994). Evolving Visual Routines. Artificial Life, 1(4), 373–389. http://doi.org/10.1162/artl.1994.1.4.373

5. Darrell, T. J., Essa, I. A., & Pentland, A. P. (1996). Task-specific gesture analysis in real-time using interpolated views. IEEE Transactions on Pattern Analysis and Machine Intelligence, 18(12), 1236–1242. http://doi.org/10.1109/34.546259

6. Maes, P., Darrell, T., Blumberg, B., & Pentland, A. (1997). The ALIVE system: wireless, full-body interaction with autonomous agents. Multimedia Systems, 5(2), 105–112. http://doi.org/10.1007/s005300050046

7. Wren, C. R., Azarbayejani, A., Darrell, T., & Pentland, A. P. (1997). Pfinder: real-time tracking of the human body. IEEE Transactions on Pattern Analysis and Machine Intelligence, 19(7), 780–785. http://doi.org/10.1109/34.598236

8. Darrell, T., Gordon, G., Harville, M., & Woodfill, J. (2000). Integrated Person Tracking Using Stereo, Color, and Pattern Detection. International Journal of Computer Vision, 37(2), 175–185. http://doi.org/10.1023/A:1008103604354

9. Ackerman, M., Darrell, T., & Weitzner, D. J. (2001). Privacy in Context. Human–Computer Interaction, 16(2–4), 167–176. http://doi.org/10.1207/S15327051HCI16234_03

10. Darrell, T., & Covell, M. (2001). Correspondence with cumulative similarity transforms. IEEE Transactions on Pattern Analysis and Machine Intelligence, 23(2), 222–227. http://doi.org/10.1109/34.908973

11. Taycher, L., & Darrell, T. (2002). Range Segmentation Using Visibility Constraints. International Journal of Computer Vision, 47(1–3), 89–98. http://doi.org/10.1023/A:1014533505864

12. Demirdjian, D., & Darrell, T. (2002). Using Multiple-Hypothesis Disparity Maps and Image Velocity for 3-D Motion Estimation. International Journal of Computer Vision, 47(1–3), 219–228. http://doi.org/10.1023/A:1014502126337

13. Bentley, F., Tollmar, K., Demirdjian, D., Koile, K., & Darrell, T. (2003). Perceptive presence. IEEE Computer Graphics and Applications, 23(5), 26–36. http://doi.org/10.1109/MCG.2003.1231175

14. Fisher, J. W., & Darrell, T. (2004). Speaker association with signal-level audiovisual fusion. IEEE Transactions on Multimedia, 6(3), 406–413. http://doi.org/10.1109/TMM.2004.827503

15. Demirdjian, D., Ko, T., & Darrell, T. (2005). Untethered gesture acquisition and recognition for virtual world manipulation. Virtual Reality, 8(4), 222–230. http://doi.org/10.1007/s10055-005-0155-3

16. Grauman, K., & Darrell, T. (2005a). Efficient image matching with distributions of local invariant features. In 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'05) (Vol. 2, pp. 627–634 vol. 2). http://doi.org/10.1109/CVPR.2005.138

17. Grauman, K., & Darrell, T. (2005b). The pyramid match kernel: discriminative classification with sets of image features. In Tenth IEEE International Conference on Computer Vision (ICCV'05) Volume 1 (Vol. 2, p. 1458–1465 Vol. 2). http://doi.org/10.1109/ICCV.2005.239

18. Christoudias, C. M., Morency, L.-P., & Darrell, T. (2006). Non-parametric and light-field deformable models. Computer Vision and Image Understanding, 104(1), 16–35. http://doi.org/10.1016/j.cviu.2006.06.001

19. Wilson, K. W., & Darrell, T. (2006). Learning a Precedence Effect-Like Weighting Function for the Generalized Cross-Correlation Framework. IEEE Transactions on Audio, Speech, and Language Processing, 14(6), 2156–2164. http://doi.org/10.1109/TASL.2006.872601

20. Taycher, L., Fisher III, J. W., & Darrell, T. (2007). Combining object and feature dynamics in probabilistic tracking. Computer Vision and Image Understanding, 108(3), 243–260. http://doi.org/10.1016/j.cviu.2006.11.022

21. Rahimi, A., Recht, B., & Darrell, T. (2007). Learning to Transform Time Series with a Few Examples. IEEE Transactions on Pattern Analysis and Machine Intelligence, 29(10), 1759–1775. http://doi.org/10.1109/TPAMI.2007.1001

22. Quattoni, A., Wang, S., Morency, L. P., Collins, M., & Darrell, T. (2007). Hidden Conditional Random Fields. IEEE Transactions on Pattern Analysis and Machine Intelligence, 29(10), 1848–1852. http://doi.org/10.1109/TPAMI.2007.1124

23. Morency, L.-P., Sidner, C., Lee, C., & Darrell, T. (2007). Head gestures for perceptual interfaces: The role of context in improving recognition. Artificial Intelligence, 171(8), 568–585. http://doi.org/10.1016/j.artint.2007.04.003

24. Rahimi, A., Morency, L.-P., & Darrell, T. (2008). Reducing drift in differential tracking. Computer Vision and Image Understanding, 109(2), 97–111. http://doi.org/10.1016/j.cviu.2006.12.004

25. Saenko, K., Livescu, K., Glass, J., & Darrell, T. (2009). Multistream Articulatory Feature-Based Models for Visual Speech Recognition. IEEE Transactions on Pattern Analysis and Machine Intelligence, 31(9), 1700–1707. http://doi.org/10.1109/TPAMI.2008.303

26. Kapoor, A., Grauman, K., Urtasun, R., & Darrell, T. (2009). Gaussian Processes for Object Categorization. International Journal of Computer Vision, 88(2), 169–188. http://doi.org/10.1007/s11263-009-0268-3

27. Stone, Z., Zickler, T., & Darrell, T. (2010). Toward Large-Scale Face Recognition Using Social Network Context. Proceedings of the IEEE, 98(8), 1408–1415. http://doi.org/10.1109/JPROC.2010.2044551

28. Miller, S., Berg, J. van den, Fritz, M., Darrell, T., Goldberg, K., & Abbeel, P. (2012). A geometric approach to robotic laundry folding. The International Journal of Robotics Research, 31(2), 249–267. http://doi.org/10.1177/0278364911430417

29. Chung, S., Mario Christoudias, C., Darrell, T., Ziniel, S. I., & Kalish, L. A. (2012a). A Novel Image-based Tool to Reunite Children With Their Families After Disasters. Academic Emergency Medicine, 19(11), 1227–1234. http://doi.org/10.1111/acem.12013

30. Chakrabarti, A., Xiong, Y., Sun, B., Darrell, T., Scharstein, D., Zickler, T., & Saenko, K. (2014). Modeling Radiometric Uncertainty for Vision with Tone-Mapped Color Images. IEEE Transactions on Pattern Analysis and Machine Intelligence, 36(11), 2185–2198. http://doi.org/10.1109/TPAMI.2014.2318713

31. Chu, V., McMahon, I., Riano, L., McDonald, C. G., He, Q., Martinez Perez-Tejada, J., … Kuchenbecker, K. J. (2015). Robotic learning of haptic adjectives through physical interaction. Robotics and Autonomous Systems, 63, Part 3, 279–292. http://doi.org/10.1016/j.robot.2014.09.021

32. Darrell, T., Ferrari, V., Jurie, F., & Lepetit, V. (2015). Introduction to the CVIU Special Issue on "Parts and Attributes. Comput. Vis. Image Underst., 138(C), 85–. http://doi.org/10.1016/j.cviu.2015.07.001

33. Song, H. O., Girshick, R., Zickler, S., Geyer, C., Felzenszwalb, P., & Darrell, T. (2015). Generalized Sparselet Models for Real-Time Multiclass Object Recognition. IEEE Transactions on Pattern Analysis and Machine Intelligence, 37(5), 1001–1012. http://doi.org/10.1109/TPAMI.2014.2353631

34. Girshick, R., Donahue, J., Darrell, T., & Malik, J. (2016). Region-Based Convolutional Networks for Accurate Object Detection and Segmentation. IEEE Transactions on Pattern Analysis and Machine Intelligence, 38(1), 142–158. http://doi.org/10.1109/TPAMI.2015.2437384

35. Guadarrama, S., Rodner, E., Saenko, K., & Darrell, T. (2016). Understanding object descriptions in robotics by open-vocabulary object retrieval and detection. The International Journal of Robotics Research, 35(1–3), 265–280. http://doi.org/10.1177/0278364915602059

36. Levine, S., Finn, C., Darrell, T., & Abbeel, P. (2016). End-to-End Training of Deep Visuomotor Policies. Journal of Machine Learning Research, 17, 1–40. Retrieved from http://www.jmlr.org/papers/volume17/15-522/15-522.pdf

37. Shelhamer, E., Long, J., & Darrell, T. (2016). Fully Convolutional Networks for Semantic Segmentation. IEEE Transactions on Pattern Analysis and Machine Intelligence, PP(99), 1–1. http://doi.org/10.1109/TPAMI.2016.2572683

38. Song, H. O., Fritz, M., Goehring, D., & Darrell, T. (2016). Learning to Detect Visual Grasp Affordance. IEEE Transactions on Automation Science and Engineering, 13(2), 798–809. http://doi.org/10.1109/TASE.2015.2396014

39. Guadarrama, S., Rodner, E., Saenko, K., Darrell, T. (2016), Understanding object descriptions in robotics by open-vocabulary object retrieval and detection, The International Journal of Robotics Research 35 (1-3), 265-280. https://doi.org/10.1177%2F0278364915602059

40. Hoffman, J., Pathak, D., Tzeng, E.,, Long, J., Guadarrama, S., Darrell, T. (2015), Large scale visual recognition through adaptation using joint representation and multiple instance learning, The Journal of Machine Learning Research 17 (1), 4954-4984. http://www.jmlr.org/papers/v17/15-223.html

41. Simon, M., Rodner, E., Darrell, T., Denzler, J. (2018), The whole is more than its parts? From explicit to implicit pose normalization, IEEE TPAMI, Published online (early access) 18 December 2018, 14pp. https://doi.org/10.1109/TPAMI.2018.2885764

42. Hu, H.-N., Yang, Y.-H., Fischer, T., Darrell, T., Yu, F., and Sun, M. (2022). Monocular quasi-dense 3d object tracking. IEEE Transactions on Pattern Analysis and Machine Intelligence. 8pp [link]

43. Liu, Z., Wang, H., Zhou, T., Shen, Z., Kang, B., Shelhamer, E., and Darrell, T. (2022). Exploring simple and transferable recognitionaware image processing. IEEE Transactions on Pattern Analysis and Machine Intelligence. 8pp. [link]

44. Ebrahimi, S., Petryk, S., Gokul, A., Gan, W., Gonzalez, J. E., Rohrbach, M., and Darrell, T. (2021). Remembering for the right reasons: Explanations reduce catastrophic forgetting. Applied AI Letters, 8pp, 2(4):e44. [link]

45. Hendricks, L. A., Rohrbach, A., Schiele, B., Darrell, T., and Akata, Z. (2021). Generating visual explanations with natural language. Applied AI Letters, 8pp, 2(4):e55. [link]

46. Kim, J., Rohrbach, A., Akata, Z., Moon, S., Misu, T., Chen, Y.-T., Darrell, T., and Canny, J. (2021). Toward explainable and advisable model for self-driving cars. Applied AI Letters, 8pp, 2(4):e56. [link]

47. Watkins, O., Huang, S., Frost, J., Bhatia, K., Weiner, E., Abbeel, P., Darrell, T., Plummer, B., Saenko, K., and Dragan, A. (2021). Explaining robot policies. Applied AI Letters, 8pp, 2(4):e52. [link]

Refereed Conference Papers (through 2022; for updates see Google Scholar)::

1. Batchelder, N., and Darrell, T. (1987), "Psfig - A Ditroff preprocessor for PostScript figures," *USENIX Conference Proceedings*, Phoenix, AZ, pp. 31-42, June 1987.

2. Darrell, T., & Wohn, K. (1988). Pyramid based depth from focus. In *Computer Society Conference on Computer Vision and Pattern Recognition, 1988. Proceedings CVPR '88* (pp. 504–509). http://doi.org/10.1109/CVPR.1988.196282

3. Pentland, A., Darrell, T., Turk, M., & Huang, W. (1989). A simple, real-time range camera. In *, IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 1989. Proceedings CVPR '89* (pp. 256–261). http://doi.org/10.1109/CVPR.1989.37858

4. Darrell, T., Sclaroff, S., & Pentland, A. (1990). Segmentation by minimal description. In *Proceedings, Third International Conference on Computer Vision, 1990* (pp. 112–116). http://doi.org/10.1109/ICCV.1990.139506

5. Darrell, T., & Pentland, A. (1991). On the representation of occluded shapes. In *IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 1991. Proceedings CVPR '91* (pp. 728–729). http://doi.org/10.1109/CVPR.1991.139802

6. Darrell, T., & Pentland, A. (1991). Robust estimation of a multi-layered motion representation. In *, Proceedings of the IEEE Workshop on Visual Motion, 1991* (pp. 173–178). http://doi.org/10.1109/WVM.1991.212810

7. Darrell, T., & Pentland, A. (1992). Against Edges: Function Approximation with Multiple Support Maps. In J. E. Moody, S. J. Hanson, & R. P. Lippmann (Eds.), *Advances in Neural Information Processing Systems 4* (pp. 388–395). Morgan-Kaufmann. Retrieved from http://papers.nips.cc/paper/462-against-edges-function-approximation-with-multiple-support-maps.pdf

8. Darrell, T., & Pentland, A. (1993). Space-time gestures. In *, 1993 IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 1993. Proceedings CVPR '93* (pp. 335–340). http://doi.org/10.1109/CVPR.1993.341109

9. Darrell, T., & Simonecelli, E. (1993). `Nulling' filters and the separation of transparent motions. In *, 1993 IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 1993. Proceedings CVPR '93* (pp. 738–739). http://doi.org/10.1109/CVPR.1993.341150

10. Johnson, M., Maes, P., & Darell, T. (1994). Artificial Life IV: Proceedings of the Fourth International Workshop on the Synthesis and Simulation of Living Systems. In *Artificial Life IV: Proceedings of the Fourth International Workshop on the Synthesis and Simulation of Living Systems* (pp. 373–389). Boston, MA: MIT Press.

11. Darrell, T. J., & Pentland, A. P. (1994). Classifying Hand Gestures with a View-Based Distributed Representation. In J. D. Cowan, G. Tesauro, & J. Alspector (Eds.), *Advances in Neural Information Processing Systems 6* (pp. 945–952). Morgan-Kaufmann. Retrieved from http://papers.nips.cc/paper/832-classifying-hand-gestures-with-a-view-based-distributed-representation.pdf

12. Pentland, A. P. & Darrell, T. (1994). Visual perception of human bodies and faces for multi-modal interfaces. In *ICSLP-1994* (pp. 543-546).

13. Essa, I. A., Darrell, T., & Pentland, A. (1994). Tracking facial motion. In *, Proceedings of the 1994 IEEE Workshop on Motion of Non-Rigid and Articulated Objects, 1994* (pp. 36–42). http://doi.org/10.1109/MNRAO.1994.346257

14. Pentland, A., Darrell, T., Essa, I., Azarbayejani, A., & Sclaroff, S. (1994). Visually guided animation. In *, Proceedings of Computer Animation '94* (pp. 112–121). http://doi.org/10.1109/CA.1994.324000

15. Maes, P., Blumberg, B., Darrell, T., Pentland, A., & Wexelblat, A. (1995). Modeling Interactive Agents in ALIVE. In *Proceedings of the 14th International Joint Conference on Artificial Intelligence - Volume 2* (pp. 2073–2074). San Francisco, CA, USA: Morgan Kaufmann Publishers Inc. Retrieved from http://dl.acm.org/citation.cfm?id=1643031.1643178

16. Darrell, T., Essa, I. A., & Pentland, A. (1995). Correlation and Interpolation Networks for Real-time Expression Analysis/Synthesis. In G. Tesauro, D. S. Touretzky, & T. K. Leen (Eds.), *Advances in Neural Information Processing Systems 7* (pp. 909–916). MIT Press. Retrieved from http://papers.nips.cc/paper/999-correlation-and-interpolation-networks-for-real-time-expression-analysissynthesis.pdf

17. Darrell, T., & Pentland, A. P. (1995). Attention-driven Expression and Gesture Analysis in an Interactive Environment. Presented at the Intl. Workshop on Automatic Face and Gesture Recognition, Zurich, Switzerland. http://doi.org/10.1.1.48.2033

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APPLE EXHIBIT 1004