- [35] J. Chen, M. Xie, Z. Xing, C. Chen, X. Xu, L. Zhu, and G. Li, "Object detection for graphical user interface: old fashioned or deep learning or a combination?" in *proceedings of the 28th ACM joint meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, 2020, pp. 1202–1214.
- [36] "difflib in python," https://docs.python.org/3/library/difflib.html 2022.
- [37] J. Qian, Z. Shang, S. Yan, Y. Wang, and L. Chen, "Roscript: a visual script driven truly non-intrusive robotic testing system for touch screen applications," in *Proceedings of the ACM/IEEE 42nd International Conference on Software Engineering*, 2020, pp. 297–308.
- [38] T.-Y. Lin, P. Dollár, R. Girshick, K. He, B. Hariharan, and S. Belongie, "Feature pyramid networks for object detection," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2017, pp. 2117–2125.
- [39] B. Deka, Z. Huang, C. Franzen, J. Hibschman, D. Afergan, Y. Li, J. Nichols, and R. Kumar, "Rico: A mobile app dataset for building data-driven design applications," in *Proceedings of the 30th Annual ACM Symposium on User Interface Software and Technology*, 2017, pp. 845–854.
- [40] X. Zhang, L. de Greef, A. Swearngin, S. White, K. Murray, L. Yu, Q. Shan, J. Nichols, J. Wu, C. Fleizach *et al.*, "Screen recognition: Creating accessibility metadata for mobile applications from pixels," in *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 2021, pp. 1–15.
- [41] N. Parmar, A. Vaswani, J. Uszkoreit, L. Kaiser, N. Shazeer, A. Ku, and D. Tran, "Image transformer," in *International Conference on Machine Learning*. PMLR, 2018, pp. 4055–4064.
- [42] "Wand python package," https://docs.wand-py.org/en/0.6.2/ 2022.
- [43] Y. Li, Z. Yang, Y. Guo, and X. Chen, "Droidbot: a lightweight ui-guided test input generator for android," in 2017 IEEE/ACM 39th International Conference on Software Engineering Companion (ICSE-C). IEEE, 2017, pp. 23–26.
- [44] A. Truong, P. Chi, D. Salesin, I. Essa, and M. Agrawala, "Automatic generation of two-level hierarchical tutorials from instructional makeup videos," in *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 2021, pp. 1–16.
- [45] C. Watman, D. Austin, N. Barnes, G. Overett, and S. Thompson, "Fast sum of absolute differences visual landmark detector," in *IEEE International Conference on Robotics and Automation*, 2004. Proceedings. *ICRA'04*. 2004, vol. 5. IEEE, 2004, pp. 4827–4832.
- [46] X.-Y. Wang, J.-F. Wu, and H.-Y. Yang, "Robust image retrieval based on color histogram of local feature regions," *Multimedia Tools and Applications*, vol. 49, no. 2, pp. 323–345, 2010.
- [47] D. G. Lowe, "Distinctive image features from scale-invariant keypoints," *International journal of computer vision*, vol. 60, no. 2, pp. 91–110, 2004.
- [48] H. Bay, T. Tuytelaars, and L. Van Gool, "Surf: Speeded up robust features," in *European conference on computer vision*. Springer, 2006, pp. 404–417.
- [49] C. Zhan, X. Duan, S. Xu, Z. Song, and M. Luo, "An improved moving object detection algorithm based on frame difference and edge detection," in *Fourth international conference on image and graphics* (*ICIG 2007*). IEEE, 2007, pp. 519–523.
- [50] S. Kaufman, S. Rosset, C. Perlich, and O. Stitelman, "Leakage in data mining: Formulation, detection, and avoidance," *ACM Transactions on Knowledge Discovery from Data (TKDD)*, vol. 6, no. 4, pp. 1–21, 2012.
- [51] I. Salman, A. T. Misirli, and N. Juristo, "Are students representatives of professionals in software engineering experiments?" in 2015 IEEE/ACM 37th IEEE international conference on software engineering, vol. 1. IEEE, 2015, pp. 666–676.
- [52] M. P. Fay and M. A. Proschan, "Wilcoxon-mann-whitney or t-test? on assumptions for hypothesis tests and multiple interpretations of decision rules," *Statistics surveys*, vol. 4, p. 1, 2010.
- [53] Y. Zhao, T. Yu, T. Su, Y. Liu, W. Zheng, J. Zhang, and W. G. Halfond, "Recdroid: automatically reproducing android application crashes from bug reports," in 2019 IEEE/ACM 41st International Conference on Software Engineering (ICSE). IEEE, 2019, pp. 128–139.
- [54] M. Fazzini, M. Prammer, M. d'Amorim, and A. Orso, "Automatically translating bug reports into test cases for mobile apps," in *Proceedings of the 27th ACM SIGSOFT International Symposium on Software Testing and Analysis*, 2018, pp. 141–152.
- [55] S. Talebipour, Y. Zhao, L. Dojcilović, C. Li, and N. Medvidović, "Ui test migration across mobile platforms," in 2021 36th IEEE/ACM

- International Conference on Automated Software Engineering (ASE). IEEE, 2021, pp. 756–767.
- [56] Y. Zhao, J. Chen, A. Sejfia, M. Schmitt Laser, J. Zhang, F. Sarro, M. Harman, and N. Medvidovic, "Fruiter: a framework for evaluating ui test reuse," in *Proceedings of the 28th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, 2020, pp. 1190–1201.
- [57] A. Hindle and C. Onuczko, "Preventing duplicate bug reports by continuously querying bug reports," *Empirical Software Engineering*, vol. 24, no. 2, pp. 902–936, 2019.
- [58] M. Xie, S. Feng, Z. Xing, J. Chen, and C. Chen, "Uied: a hybrid tool for gui element detection," in *Proceedings of the 28th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, 2020, pp. 1655–1659.
- [59] A. T. Nguyen, T. T. Nguyen, T. N. Nguyen, D. Lo, and C. Sun, "Duplicate bug report detection with a combination of information retrieval and topic modeling," in 2012 Proceedings of the 27th IEEE/ACM international conference on automated software engineering. IEEE, 2012, pp. 70–79.
- [60] N. Cooper, C. Bernal-Cárdenas, O. Chaparro, K. Moran, and D. Poshyvanyk, "It takes two to tango: Combining visual and textual information for detecting duplicate video-based bug reports," in 2021 IEEE/ACM 43rd International Conference on Software Engineering (ICSE). IEEE, 2021, pp. 957–969.
- [61] X. Liu, P. Carrington, X. Chen, and A. Pavel, "What makes videos accessible to blind and visually impaired people?" in *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 2021, pp. 1–14.
- [62] Y. Li, G. Li, L. He, J. Zheng, H. Li, and Z. Guan, "Widget captioning: Generating natural language description for mobile user interface elements," 2020, pp. 5495–5510.
- [63] T. J.-J. Li, M. Radensky, J. Jia, K. Singarajah, T. M. Mitchell, and B. A. Myers, "Pumice: A multi-modal agent that learns concepts and conditionals from natural language and demonstrations," in *Proceedings of the 32nd annual ACM symposium on user interface software and technology*, 2019, pp. 577–589.
- [64] T. J.-J. Li and O. Riva, "Kite: Building conversational bots from mobile apps," in *Proceedings of the 16th Annual International Conference on Mobile Systems, Applications, and Services*, 2018, pp. 96–109.
- [65] C. Chen, S. Feng, Z. Xing, L. Liu, S. Zhao, and J. Wang, "Gallery dc: Design search and knowledge discovery through auto-created gui component gallery," *Proceedings of the ACM on Human-Computer Interaction*, vol. 3, no. CSCW, pp. 1–22, 2019.
- [66] S. Feng, C. Chen, and Z. Xing, "Gallery dc: Auto-created gui component gallery for design search and knowledge discovery," in *Proceedings of the ACM/IEEE 44th International Conference on Software Engineering: Companion Proceedings*, 2022, pp. 80–84.
- [67] C. Chen, S. Feng, Z. Liu, Z. Xing, and S. Zhao, "From lost to found: Discover missing ui design semantics through recovering missing tags," *Proceedings of the ACM on Human-Computer Interaction*, vol. 4, no. CSCW2, pp. 1–22, 2020.
- [68] Z. Liu, C. Chen, J. Wang, X. Che, Y. Huang, J. Hu, and Q. Wang, "Fill in the blank: Context-aware automated text input generation for mobile gui testing," *arXiv preprint arXiv:2212.04732*, 2022.
- [69] M. Xie, Z. Xing, S. Feng, C. Chen, L. Zhu, and X. Xu, "Psychologically-inspired, unsupervised inference of perceptual groups of gui widgets from gui images," *arXiv preprint arXiv:2206.10352*, 2022.
- [70] Z. Liu, C. Chen, J. Wang, Y. Huang, J. Hu, and Q. Wang, "Guided bug crush: Assist manual gui testing of android apps via hint moves," in *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*, 2022, pp. 1–14.
- [71] —, "Owl eyes: Spotting ui display issues via visual understanding," in 2020 35th IEEE/ACM International Conference on Automated Software Engineering (ASE). IEEE, 2020, pp. 398–409.
- [72] Y. Su, C. Chen, J. Wang, Z. Liu, D. Wang, S. Li, and Q. Wang, "The metamorphosis: Automatic detection of scaling issues for mobile apps," in *37th IEEE/ACM International Conference on Automated Software Engineering*, 2022, pp. 1–12.
- [73] Z. Liu, C. Chen, J. Wang, Y. Huang, J. Hu, and Q. Wang, "Nighthawk: Fully automated localizing ui display issues via visual understanding," *IEEE Transactions on Software Engineering*, vol. 49, no. 1, pp. 403–418, 2022.