Advancing Pet Face Recognition: A Deep Learning Approach With a Large-Scale Dataset

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Every year in the U.S., millions of cats and dogs go missing, but only a few are reunited with their owners. To address this issue, our study proposes a deep learning approach for matching lost and found pets by using the SOTA face recognition model. One of the main challenges in this field is the lack of large-scale pet face recognition datasets for achieving high-performance models, primarily due to the difficulty in collecting multiple photos of the same pet. In response to this problem, our study proposes an algorithm to collect a pet face recognition dataset and use it to train a face recognition model. We have constructed a large-scale pet face dataset containing 550K photos, averaging 33 photos per ID. Considering real-world applications, lost or found pet posts typically contain 2 to 3 photos. We additionally collected a test set with an average of 2.7 photos per ID. The pet face recognition model achieves a Top-1 Accuracy of 90.7%, a Top-5 Accuracy of 92.5%, and a Top-10 Accuracy of 94.5% on the test set. Our model also assists the local university in a project related to the welfare of stray cats. Volunteers are organized to photograph stray cats regularly, and our model is employed for effective detection, recognition, and establishment of a database that assigns unique IDs to each stray cat, facilitating tracking and reidentification. The project aims to estimate the population of stray cats and actively share information, stories, and promotions on various social platforms, advocating for adoption over purchase.

Awards Won:
Association for the Advancement of Artificial Intelligence: Honorable Mention (do not read aloud). Winners receive a student level membership. Information is included separately in the SAO Portal.
Association for the Advancement of Artificial Intelligence: AAAI Student Memberships for each finalist that is part of the 1st, 2nd, and 3rd Prize Winning projects and 5 Honorable Mention winning projects (up to 3 students per project) (in-kind award / part of the 1st-3rd prize)
Association for the Advancement of Artificial Intelligence: AAAI Membership for the School Libraries of All 8 Winners (in-kind award / part of 1st-3rd prize and honorable mentions' prize)