

CASE STUDY

Image Collection & Annotation to Enhance Image Recognition Models

High-quality image data sourced and annotated to train image recognition models for new smartphone series



COMPANY

A Leading Electronics Company



INDUSTRY

Electronics



USE CASE

Computer Vision



OUR OFFERING

- Image Collection
- Image Annotation

KEY STATS

Images Collected

40,000

Images Annotated

20,000

Project Timeline

50 DAYS

OVERVIEW



Client's Bangalore R&D Center outside of South Korea is a key innovation hub. Their focus is on creating cutting-edge technologies across multiple areas of business that transform the experiences of users both globally, as well as in local markets.

The specific purpose of the R&D center is two fold: to create USPs for global flagship devices by creating significant advancements in Modem, Multimedia, AI, Internet of Things, and to make for India by catering to the specific needs of Indian consumers.

CHALLENGES

Customized high-quality image data collection & annotation has always been a bottleneck in building robust image recognition models.. Sourcing image datasets in large volumes and annotating them as per guidelines, with the required quality that is sufficient enough to build AI capabilities, has always been a time-consuming, expensive task that requires skilled resources from various domains. The critical requirements of the client were:

- 40,000 images to be captured with over 100+ variations w.r.t. photo location, lighting condition, distance from camera, food & object variety etc.
- Out of the 40,000 images 20,000 images to be annotated with semantic segmentation of shadow areas with multi-color masking.

SOLUTION

With our expertise, we helped the client to source, curate, and annotate the right set of image data required to train their AI-enabled image recognition models, with utmost precision. We helped the client with:

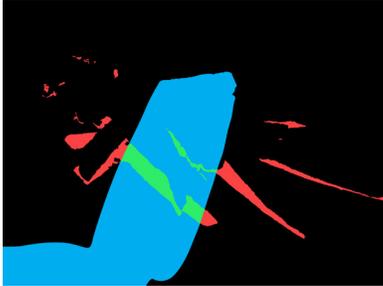
- 40,000 food and document images, were collected in triplets based on custom-requirements i.e., variation in food items like an appetizer, main course, desserts, drinks, and variations in documents like a magazine cover, invoice, newspaper, etc.
- Captured 100+ variations w.r.t. background, indoor v/s outdoor, illumination conditions, distance from camera, occluders etc.
- Out of the 40,000 images collected, we annotated 15,000 unique food images and 5,000 unique document images with semantic segmentation of shadow areas with multi-color masking
- We successfully delivered high-quality, diverse, and well-annotated food/document images within the given timelines.

Summary of Requirements				
Sr.No.	Description (Image Triplets)	Total	Food	Document
1.	Image Collection An Image with Shadow	20,000	15,000	5000
2.	Image Collection A Shadow-free Image	20,000	15,000	5000
3.	Image Annotation Shadow Mask with 3 Different Colors	20,000	15,000	5000
Total Assets		60,000	45,000	15,000

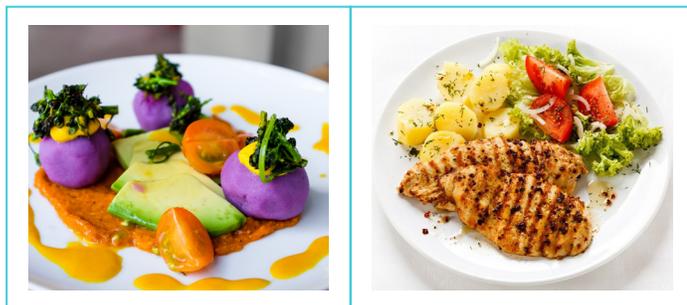
General guidelines followed:

- Devices to capture images: Samsung Galaxy S10 & Note 10
- Data Delivery: Amazon AWS S3
- Close-up of food Images (i.e., appetizer, main course, desserts, drinks) from different cuisines (western, asian, continental), served in different utensils like bowls/plates/tables. The food images should be captured with top & side view. Same lighting & camera positions applicable while capturing shadow & shadow-free images.
- Scan different shapes from Visiting card, Textbook, Magazine, Newspaper, One pager, Slip, Article, Research Paper with shadows caused due by external objects
- Occluders for creating shadow: Smartphone (50%), Hand and Human-like shape (30%), Others (10%)
- Variations by distance from the camera (15 cm, 12 cm, 10 cm, 7 cm, 5 cm), and angle of capture (0-15 degree, 15-30 degrees, 30- 45 degree, etc.)
- Variations in ambient lighting (incandescent lamp, fluorescent lamp, sunlight, moonlight, etc.)
- SNS quality images: Capture high-quality RGB images with different resolutions (e.g., HD, Full HD, 8MP, 12 MP, 16 MP, 48 MP, etc.) using various Smartphone (Galaxy, iPhone)
- For each Triplet, get the RAW image in DNG format and JPEG (YUV) Compressed Version

Example: Data Collection (A set of 3 image types/triplets)

Image Collection An Image with a Shadow	Image Collection A Shadow-free Image	Image Collection & Annotation Annotated Shadow Mask (with 3 different colors)
		

Example: Close-up of Food Images with top and side view



Example: Variation in food items like Appetizers, Main course, Desserts, Drinks



Example: Variation in utensils like bowls/plates/tables



Example: Variation in cuisines Western, Asian, Continental



THE OUTCOME

The high-quality image data empowered the client to accurately train its image recognition model to launch its new smartphone series.

CUSTOMER TESTIMONIAL



"We were pleasantly surprised with Shaip's deep expertise in image data collection and annotation projects. Quick turnaround time and their approach to project execution, were robust and comprehensive that empowered us to accurately train our ML models."



Headquartered in Louisville, Kentucky, Shaip offers a human-in-the-loop platform and services to support all aspects of managing training data for the development of AI/ML models. From data collection, licensing, curation, labeling to the seamless scalability of our people, platform, and processes, Shaip contributes to a diverse set of verticals. To learn more, visit us at www.shaip.com.