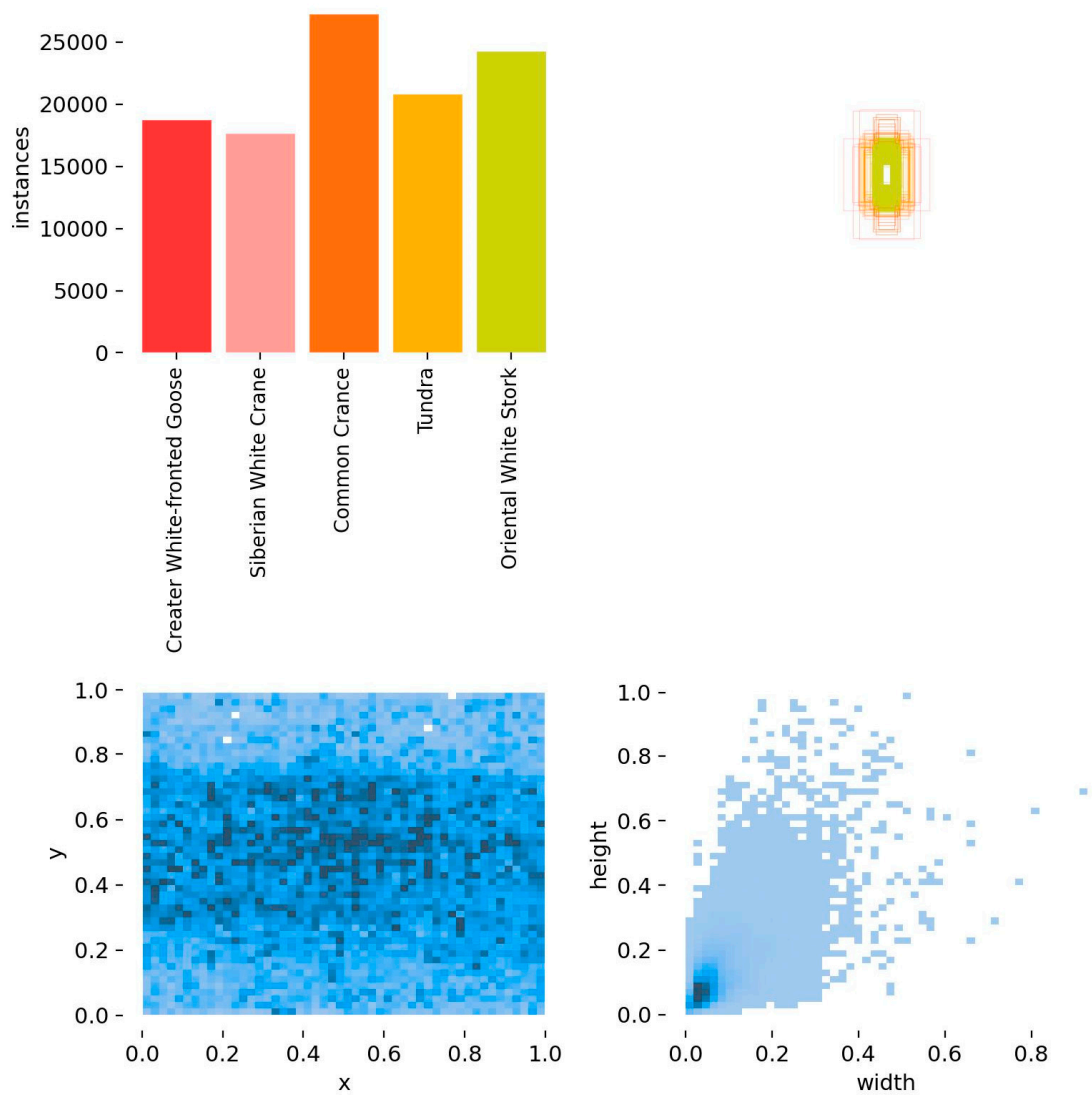
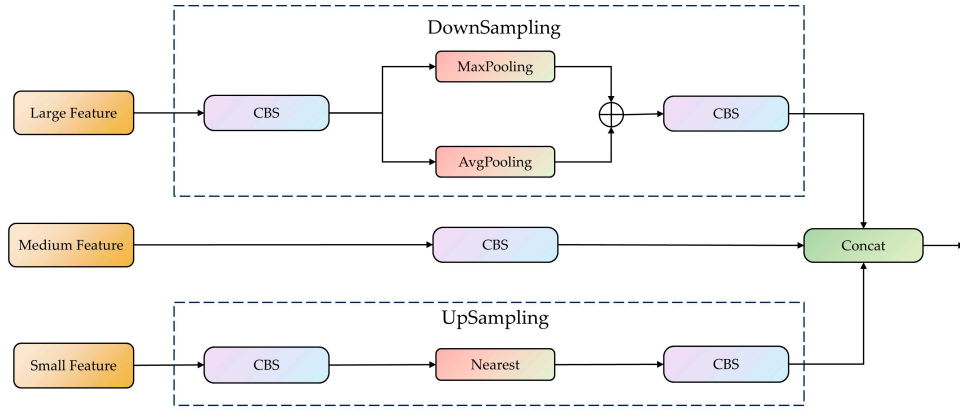




**Figure S1.** PTZ camera.



**Figure S2.** The detailed information about PYLB-5-2023.



**Figure S3.** The overall structure of the Triple Feature Encoding module.

**Table S1.** The detailed information about PTZ camera.

| Parameters                        | Value   |
|-----------------------------------|---|
| Image Sensor                      | 1/1.8" CMOS   |
| Max. Resolution                   | 1920 (H) × 1080 (V)                                 |
| Min. Illumination                 | Color: 0.005 Lux @ (F1.2, AGCON)                    |
|                                   | B/W: 0.001 Lux @ (F1.2, AGCON)                      |
|                                   | 0 Lux with laser                                    |
| Focal Length                      | 6 mm – 318 mm                                       |
| Optical Zoom                      | 53×   |
| Pan/Tilt Range                    | Pan: 0° to 360° endless; Tilt: -45° to +45°         |
| Manual Control Speed              | Pan: 0.1°/s – 120°/s; Tilt: 0.1°/s – 50°/s          |
| Preset Speed                      | Pan: 120°/s; Tilt: 50°/s                            |
| Main stream frame rate resolution | 50Hz: 25fps (1920x1080)                             |
|                                   | 60Hz: 30fps (1920x1080)                             |
| Storage                           | NAS (NFS, SMB/CIFS), ANR,<br>Micro SD card (256 GB) |
| GPS                               | Support   |