Atitt opencv4.5 api

## 图像处理

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| 模块 | |
|  | **[图像过滤](https://docs.opencv.org/4.5.5/d4/d86/group__imgproc__filter.html)** |
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|  | **[几何图像变换](https://docs.opencv.org/4.5.5/da/d54/group__imgproc__transform.html)** |
|  | |
|  | **[杂项图像转换](https://docs.opencv.org/4.5.5/d7/d1b/group__imgproc__misc.html)** |
|  | |
|  | **[绘图功能](https://docs.opencv.org/4.5.5/d6/d6e/group__imgproc__draw.html)** |
|  | |
|  | **[色彩空间转换](https://docs.opencv.org/4.5.5/d8/d01/group__imgproc__color__conversions.html)** |
|  | |
|  | **[OpenCV 中的颜色映射](https://docs.opencv.org/4.5.5/d3/d50/group__imgproc__colormap.html)** |
|  | |
|  | **[平面细分](https://docs.opencv.org/4.5.5/df/d5b/group__imgproc__subdiv2d.html)** |
|  | |
|  | **[直方图](https://docs.opencv.org/4.5.5/d6/dc7/group__imgproc__hist.html)** |
|  | |
|  | **[结构分析和形状描述符](https://docs.opencv.org/4.5.5/d3/dc0/group__imgproc__shape.html)** |
|  | |
|  | **[运动分析和对象跟踪](https://docs.opencv.org/4.5.5/d7/df3/group__imgproc__motion.html)** |
|  | |
|  | **[特征检测](https://docs.opencv.org/4.5.5/dd/d1a/group__imgproc__feature.html)** |
|  | |
|  | **[物体检测](https://docs.opencv.org/4.5.5/df/dfb/group__imgproc__object.html)** |
| |  |  | | --- | --- | | Functions | | | void | **[cv::matchTemplate](https://docs.opencv.org/4.5.5/df/dfb/group__imgproc__object.html" \l "ga586ebfb0a7fb604b35a23d85391329be)** (**[InputArray](https://docs.opencv.org/4.5.5/dc/d84/group__core__basic.html" \l "ga353a9de602fe76c709e12074a6f362ba)** image, **[InputArray](https://docs.opencv.org/4.5.5/dc/d84/group__core__basic.html" \l "ga353a9de602fe76c709e12074a6f362ba)** templ, **[OutputArray](https://docs.opencv.org/4.5.5/dc/d84/group__core__basic.html" \l "gaad17fda1d0f0d1ee069aebb1df2913c0)** result, int method, **[InputArray](https://docs.opencv.org/4.5.5/dc/d84/group__core__basic.html" \l "ga353a9de602fe76c709e12074a6f362ba)** mask=**[noArray](https://docs.opencv.org/4.5.5/dc/d84/group__core__basic.html" \l "gad9287b23bba2fed753b36ef561ae7346)**()) | |  | Compares a template against overlap | | |
|  | **[图像分割](https://docs.opencv.org/4.5.5/d3/d47/group__imgproc__segmentation.html)** |
|  | |
|  | **[C API](https://docs.opencv.org/4.5.5/df/d4e/group__imgproc__c.html)** |
|  | |
|  | **[硬件加速层](https://docs.opencv.org/4.5.5/d3/df3/group__imgproc__hal.html)** |

## Object Detection

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| Modules | |
|  | **[C API](https://docs.opencv.org/4.5.5/d9/d31/group__objdetect__c.html)** |
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| Classes | |
| class | **[cv::BaseCascadeClassifier](https://docs.opencv.org/4.5.5/da/dd5/classcv_1_1BaseCascadeClassifier.html)** |
|  | |
| class | **[cv::CascadeClassifier](https://docs.opencv.org/4.5.5/d1/de5/classcv_1_1CascadeClassifier.html)** |
|  | Cascade classifier class for object detection. [More...](https://docs.opencv.org/4.5.5/d1/de5/classcv_1_1CascadeClassifier.html" \l "details) |
|  | |
| struct | **[cv::DefaultDeleter< CvHaarClassifierCascade >](https://docs.opencv.org/4.5.5/d9/ddf/structcv_1_1DefaultDeleter_3_01CvHaarClassifierCascade_01_4.html)** |
|  | |
| class | **[cv::DetectionBasedTracker](https://docs.opencv.org/4.5.5/db/de9/classcv_1_1DetectionBasedTracker.html)** |
|  | |
| struct | **[cv::DetectionROI](https://docs.opencv.org/4.5.5/d3/d34/structcv_1_1DetectionROI.html)** |
|  | struct for detection region of interest (ROI) [More...](https://docs.opencv.org/4.5.5/d3/d34/structcv_1_1DetectionROI.html" \l "details) |
|  | |
| struct | **[cv::HOGDescriptor](https://docs.opencv.org/4.5.5/d5/d33/structcv_1_1HOGDescriptor.html)** |
|  | Implementation of HOG (Histogram of Oriented Gradients) descriptor and object detector. [More...](https://docs.opencv.org/4.5.5/d5/d33/structcv_1_1HOGDescriptor.html" \l "details) |
|  | |
| class | **[cv::QRCodeDetector](https://docs.opencv.org/4.5.5/de/dc3/classcv_1_1QRCodeDetector.html)** |
|  | |
| class | **[cv::QRCodeEncoder](https://docs.opencv.org/4.5.5/d2/dbb/classcv_1_1QRCodeEncoder.html)** |
|  | |
| class | **[cv::SimilarRects](https://docs.opencv.org/4.5.5/d1/d65/classcv_1_1SimilarRects.html)** |

* 主要模块：
  + 核。**[核心功能](https://docs.opencv.org/4.5.5/d0/de1/group__core.html)**
  + imgproc. **[图像处理](https://docs.opencv.org/4.5.5/d7/dbd/group__imgproc.html)**
  + img 编解码器。**[图像文件读写](https://docs.opencv.org/4.5.5/d4/da8/group__imgcodecs.html)**
  + 视频。**[视频输入/输出](https://docs.opencv.org/4.5.5/dd/de7/group__videoio.html)**
  + 高贵。**[高级图形用户界面](https://docs.opencv.org/4.5.5/d7/dfc/group__highgui.html)**
  + 视频。**[视频分析](https://docs.opencv.org/4.5.5/d7/de9/group__video.html)**
  + 校准3d。**[相机校准和 3D 重建](https://docs.opencv.org/4.5.5/d9/d0c/group__calib3d.html)**
  + 特征2d。**[二维特征框架](https://docs.opencv.org/4.5.5/da/d9b/group__features2d.html)**
  + 对象检测。**[物体检测](https://docs.opencv.org/4.5.5/d5/d54/group__objdetect.html)**
  + dnn。**[深度神经网络模块](https://docs.opencv.org/4.5.5/d6/d0f/group__dnn.html)**
  + 毫升。**[机器学习](https://docs.opencv.org/4.5.5/dd/ded/group__ml.html)**
  + 弗兰 **[多维空间中的聚类和搜索](https://docs.opencv.org/4.5.5/dc/de5/group__flann.html)**
  + 照片。**[计算摄影](https://docs.opencv.org/4.5.5/d1/d0d/group__photo.html)**
  + 缝合。**[图像拼接](https://docs.opencv.org/4.5.5/d1/d46/group__stitching.html)**
  + 盖比。**[图形 API](https://docs.opencv.org/4.5.5/d0/d1e/gapi.html)**
* 额外模块：
  + 字母表。**[Alpha 遮罩](https://docs.opencv.org/4.5.5/d4/d40/group__alphamat.html)**
  + 阿鲁科 **[ArUco 标记检测](https://docs.opencv.org/4.5.5/d9/d6a/group__aruco.html)**
  + 条码。**[条码检测和解码方法](https://docs.opencv.org/4.5.5/d2/dea/group__barcode.html)**
  + bgsegm。**[改进的背景-前景分割方法](https://docs.opencv.org/4.5.5/d2/d55/group__bgsegm.html)**
  + 生物启发。**[受生物启发的视觉模型和衍生工具](https://docs.opencv.org/4.5.5/dd/deb/group__bioinspired.html)**
  + 卡利布。**[用于 3D 重建的自定义校准模式](https://docs.opencv.org/4.5.5/d3/ddc/group__ccalib.html)**
  + cudaarithm。**[矩阵运算](https://docs.opencv.org/4.5.5/d5/d8e/group__cudaarithm.html)**
  + cudabgsegm。**[背景分割](https://docs.opencv.org/4.5.5/d6/d17/group__cudabgsegm.html)**
  + cudacodec。**[视频编码/解码](https://docs.opencv.org/4.5.5/d0/d61/group__cudacodec.html)**
  + cudafeatures2d. **[特征检测和描述](https://docs.opencv.org/4.5.5/d6/d1d/group__cudafeatures2d.html)**
  + 库达过滤器。**[图像过滤](https://docs.opencv.org/4.5.5/dc/d66/group__cudafilters.html)**
  + cudaimgproc。**[图像处理](https://docs.opencv.org/4.5.5/d0/d05/group__cudaimgproc.html)**
  + cudalegacy。**[传统支持](https://docs.opencv.org/4.5.5/d5/dc3/group__cudalegacy.html)**
  + cudaobj检测。**[物体检测](https://docs.opencv.org/4.5.5/d9/d3f/group__cudaobjdetect.html)**
  + cudaopt流。**[光流](https://docs.opencv.org/4.5.5/d7/d3f/group__cudaoptflow.html)**
  + cudastereo。**[立体声对应](https://docs.opencv.org/4.5.5/dd/d47/group__cudastereo.html)**
  + cudawarping。**[图像变形](https://docs.opencv.org/4.5.5/db/d29/group__cudawarping.html)**
  + 库德夫。**[设备层](https://docs.opencv.org/4.5.5/df/dfc/group__cudev.html)**
  + 简历。**[用于计算机视觉程序交互式可视化调试的 GUI](https://docs.opencv.org/4.5.5/df/dff/group__cvv.html)**
  + 数据集。**[处理不同数据集的框架](https://docs.opencv.org/4.5.5/d8/d00/group__datasets.html)**
  + dnn\_obj 检测。**[用于对象检测的 DNN](https://docs.opencv.org/4.5.5/d5/df6/group__dnn__objdetect.html)**
  + dnn\_superres。**[DNN 用于超分辨率](https://docs.opencv.org/4.5.5/d9/de0/group__dnn__superres.html)**
  + 分分钟。**[基于可变形零件的模型](https://docs.opencv.org/4.5.5/d9/d12/group__dpm.html)**
  + 脸。**[人脸分析](https://docs.opencv.org/4.5.5/db/d7c/group__face.html)**
  + 自由式。**[使用 freetype/harfbuzz 绘制 UTF-8 字符串](https://docs.opencv.org/4.5.5/d4/dfc/group__freetype.html)**
  + 模糊。**[基于模糊数学的图像处理](https://docs.opencv.org/4.5.5/df/d5b/group__fuzzy.html)**
  + 高清晰度电视。**[分层数据格式 I/O 例程](https://docs.opencv.org/4.5.5/db/d77/group__hdf.html)**
  + 高频。**[用于高效图像分割的分层特征选择](https://docs.opencv.org/4.5.5/dc/d29/group__hfs.html)**
  + img\_hash。**[该模块带来了不同图像散列算法的实现。](https://docs.opencv.org/4.5.5/d4/d93/group__img__hash.html)**
  + 强度变换。**[该模块实现了强度变换算法来调整图像对比度。](https://docs.opencv.org/4.5.5/dc/dfe/group__intensity__transform.html)**
  + 朱莉娅 **[OpenCV 的 Julia 绑定](https://docs.opencv.org/4.5.5/d7/d44/group__julia.html)**
  + 行描述符。**[从图像中提取的线的二进制描述符](https://docs.opencv.org/4.5.5/dc/ddd/group__line__descriptor.html)**
  + 微信公众号 **[麦克白图表模块](https://docs.opencv.org/4.5.5/dd/d19/group__mcc.html)**
  + 光流。**[光流算法](https://docs.opencv.org/4.5.5/d2/d84/group__optflow.html)**
  + 奥维。**[食人魔 3D 视图](https://docs.opencv.org/4.5.5/d2/d17/group__ovis.html)**
  + 相位展开。**[相位展开 API](https://docs.opencv.org/4.5.5/df/d3a/group__phase__unwrapping.html)**
  + 阴谋。**[Mat 数据的绘图函数](https://docs.opencv.org/4.5.5/db/dfe/group__plot.html)**
  + 质量。**[图像质量分析 (IQA) API](https://docs.opencv.org/4.5.5/dc/d20/group__quality.html)**
  + 迅速的。**[基于轮廓的 3D 对象跟踪](https://docs.opencv.org/4.5.5/d4/dc4/group__rapid.html)**
  + 注册 **[图像配准](https://docs.opencv.org/4.5.5/db/d61/group__reg.html)**
  + rgbd。**[RGB深度处理](https://docs.opencv.org/4.5.5/d2/d3a/group__rgbd.html)**
  + 显着性。**[显着性 API](https://docs.opencv.org/4.5.5/d8/d65/group__saliency.html)**
  + sfm **[运动结构](https://docs.opencv.org/4.5.5/d8/d8c/group__sfm.html)**
  + 形状。**[形状距离和匹配](https://docs.opencv.org/4.5.5/d1/d85/group__shape.html)**
  + 立体声。**[立体对应算法](https://docs.opencv.org/4.5.5/dd/d86/group__stereo.html)**
  + 结构光。**[结构光 API](https://docs.opencv.org/4.5.5/d1/d90/group__structured__light.html)**
  + 超能力。**[超分辨率](https://docs.opencv.org/4.5.5/d7/d0a/group__superres.html)**
  + 表面匹配。**[表面匹配](https://docs.opencv.org/4.5.5/d9/d25/group__surface__matching.html)**
  + 文本。**[场景文本检测与识别](https://docs.opencv.org/4.5.5/d4/d61/group__text.html)**
  + 追踪。**[追踪 API](https://docs.opencv.org/4.5.5/d9/df8/group__tracking.html)**
  + 视频标签。**[视频稳定](https://docs.opencv.org/4.5.5/d5/d50/group__videostab.html)**
  + 即。**[3D 可视化器](https://docs.opencv.org/4.5.5/d1/d19/group__viz.html)**
  + 微信二维码。**[微信二维码检测器，用于检测和解析二维码。](https://docs.opencv.org/4.5.5/dd/d63/group__wechat__qrcode.html)**
  + xfeatures2d。**[额外的 2D 功能框架](https://docs.opencv.org/4.5.5/d1/db4/group__xfeatures2d.html)**
  + ximgproc。**[扩展图像处理](https://docs.opencv.org/4.5.5/df/d2d/group__ximgproc.html)**
  + xobj检测。**[扩展对象检测](https://docs.opencv.org/4.5.5/d4/d54/group__xobjdetect.html)**
  + xphoto。**[其他照片处理算法](https://docs.opencv.org/4.5.5/de/daa/group__xphoto.html)**
* Main modules:
  + core. **[Core functionality](https://docs.opencv.org/4.5.5/d0/de1/group__core.html)**
  + imgproc. **[Image Processing](https://docs.opencv.org/4.5.5/d7/dbd/group__imgproc.html)**
  + imgcodecs. **[Image file reading and writing](https://docs.opencv.org/4.5.5/d4/da8/group__imgcodecs.html)**
  + videoio. **[Video I/O](https://docs.opencv.org/4.5.5/dd/de7/group__videoio.html)**
  + highgui. **[High-level GUI](https://docs.opencv.org/4.5.5/d7/dfc/group__highgui.html)**
  + video. **[Video Analysis](https://docs.opencv.org/4.5.5/d7/de9/group__video.html)**
  + calib3d. **[Camera Calibration and 3D Reconstruction](https://docs.opencv.org/4.5.5/d9/d0c/group__calib3d.html)**
  + features2d. **[2D Features Framework](https://docs.opencv.org/4.5.5/da/d9b/group__features2d.html)**
  + objdetect. **[Object Detection](https://docs.opencv.org/4.5.5/d5/d54/group__objdetect.html)**
  + dnn. **[Deep Neural Network module](https://docs.opencv.org/4.5.5/d6/d0f/group__dnn.html)**
  + ml. **[Machine Learning](https://docs.opencv.org/4.5.5/dd/ded/group__ml.html)**
  + flann. **[Clustering and Search in Multi-Dimensional Spaces](https://docs.opencv.org/4.5.5/dc/de5/group__flann.html)**
  + photo. **[Computational Photography](https://docs.opencv.org/4.5.5/d1/d0d/group__photo.html)**
  + stitching. **[Images stitching](https://docs.opencv.org/4.5.5/d1/d46/group__stitching.html)**
  + gapi. **[Graph API](https://docs.opencv.org/4.5.5/d0/d1e/gapi.html)**
* Extra modules:
  + alphamat. **[Alpha Matting](https://docs.opencv.org/4.5.5/d4/d40/group__alphamat.html)**
  + aruco. **[ArUco Marker Detection](https://docs.opencv.org/4.5.5/d9/d6a/group__aruco.html)**
  + barcode. **[Barcode detecting and decoding methods](https://docs.opencv.org/4.5.5/d2/dea/group__barcode.html)**
  + bgsegm. **[Improved Background-Foreground Segmentation Methods](https://docs.opencv.org/4.5.5/d2/d55/group__bgsegm.html)**
  + bioinspired. **[Biologically inspired vision models and derivated tools](https://docs.opencv.org/4.5.5/dd/deb/group__bioinspired.html)**
  + ccalib. **[Custom Calibration Pattern for 3D reconstruction](https://docs.opencv.org/4.5.5/d3/ddc/group__ccalib.html)**
  + cudaarithm. **[Operations on Matrices](https://docs.opencv.org/4.5.5/d5/d8e/group__cudaarithm.html)**
  + cudabgsegm. **[Background Segmentation](https://docs.opencv.org/4.5.5/d6/d17/group__cudabgsegm.html)**
  + cudacodec. **[Video Encoding/Decoding](https://docs.opencv.org/4.5.5/d0/d61/group__cudacodec.html)**
  + cudafeatures2d. **[Feature Detection and Description](https://docs.opencv.org/4.5.5/d6/d1d/group__cudafeatures2d.html)**
  + cudafilters. **[Image Filtering](https://docs.opencv.org/4.5.5/dc/d66/group__cudafilters.html)**
  + cudaimgproc. **[Image Processing](https://docs.opencv.org/4.5.5/d0/d05/group__cudaimgproc.html)**
  + cudalegacy. **[Legacy support](https://docs.opencv.org/4.5.5/d5/dc3/group__cudalegacy.html)**
  + cudaobjdetect. **[Object Detection](https://docs.opencv.org/4.5.5/d9/d3f/group__cudaobjdetect.html)**
  + cudaoptflow. **[Optical Flow](https://docs.opencv.org/4.5.5/d7/d3f/group__cudaoptflow.html)**
  + cudastereo. **[Stereo Correspondence](https://docs.opencv.org/4.5.5/dd/d47/group__cudastereo.html)**
  + cudawarping. **[Image Warping](https://docs.opencv.org/4.5.5/db/d29/group__cudawarping.html)**
  + cudev. **[Device layer](https://docs.opencv.org/4.5.5/df/dfc/group__cudev.html)**
  + cvv. **[GUI for Interactive Visual Debugging of Computer Vision Programs](https://docs.opencv.org/4.5.5/df/dff/group__cvv.html)**
  + datasets. **[Framework for working with different datasets](https://docs.opencv.org/4.5.5/d8/d00/group__datasets.html)**
  + dnn\_objdetect. **[DNN used for object detection](https://docs.opencv.org/4.5.5/d5/df6/group__dnn__objdetect.html)**
  + dnn\_superres. **[DNN used for super resolution](https://docs.opencv.org/4.5.5/d9/de0/group__dnn__superres.html)**
  + dpm. **[Deformable Part-based Models](https://docs.opencv.org/4.5.5/d9/d12/group__dpm.html)**
  + face. **[Face Analysis](https://docs.opencv.org/4.5.5/db/d7c/group__face.html)**
  + freetype. **[Drawing UTF-8 strings with freetype/harfbuzz](https://docs.opencv.org/4.5.5/d4/dfc/group__freetype.html)**
  + fuzzy. **[Image processing based on fuzzy mathematics](https://docs.opencv.org/4.5.5/df/d5b/group__fuzzy.html)**
  + hdf. **[Hierarchical Data Format I/O routines](https://docs.opencv.org/4.5.5/db/d77/group__hdf.html)**
  + hfs. **[Hierarchical Feature Selection for Efficient Image Segmentation](https://docs.opencv.org/4.5.5/dc/d29/group__hfs.html)**
  + img\_hash. **[The module brings implementations of different image hashing algorithms.](https://docs.opencv.org/4.5.5/d4/d93/group__img__hash.html)**
  + intensity\_transform. **[The module brings implementations of intensity transformation algorithms to adjust image contrast.](https://docs.opencv.org/4.5.5/dc/dfe/group__intensity__transform.html)**
  + julia. **[Julia bindings for OpenCV](https://docs.opencv.org/4.5.5/d7/d44/group__julia.html)**
  + line\_descriptor. **[Binary descriptors for lines extracted from an image](https://docs.opencv.org/4.5.5/dc/ddd/group__line__descriptor.html)**
  + mcc. **[Macbeth Chart module](https://docs.opencv.org/4.5.5/dd/d19/group__mcc.html)**
  + optflow. **[Optical Flow Algorithms](https://docs.opencv.org/4.5.5/d2/d84/group__optflow.html)**
  + ovis. **[OGRE 3D Visualiser](https://docs.opencv.org/4.5.5/d2/d17/group__ovis.html)**
  + phase\_unwrapping. **[Phase Unwrapping API](https://docs.opencv.org/4.5.5/df/d3a/group__phase__unwrapping.html)**
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  + structured\_light. **[Structured Light API](https://docs.opencv.org/4.5.5/d1/d90/group__structured__light.html)**
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  + xphoto. **[Additional photo processing algorithms](https://docs.opencv.org/4.5.5/de/daa/group__xphoto.html)**