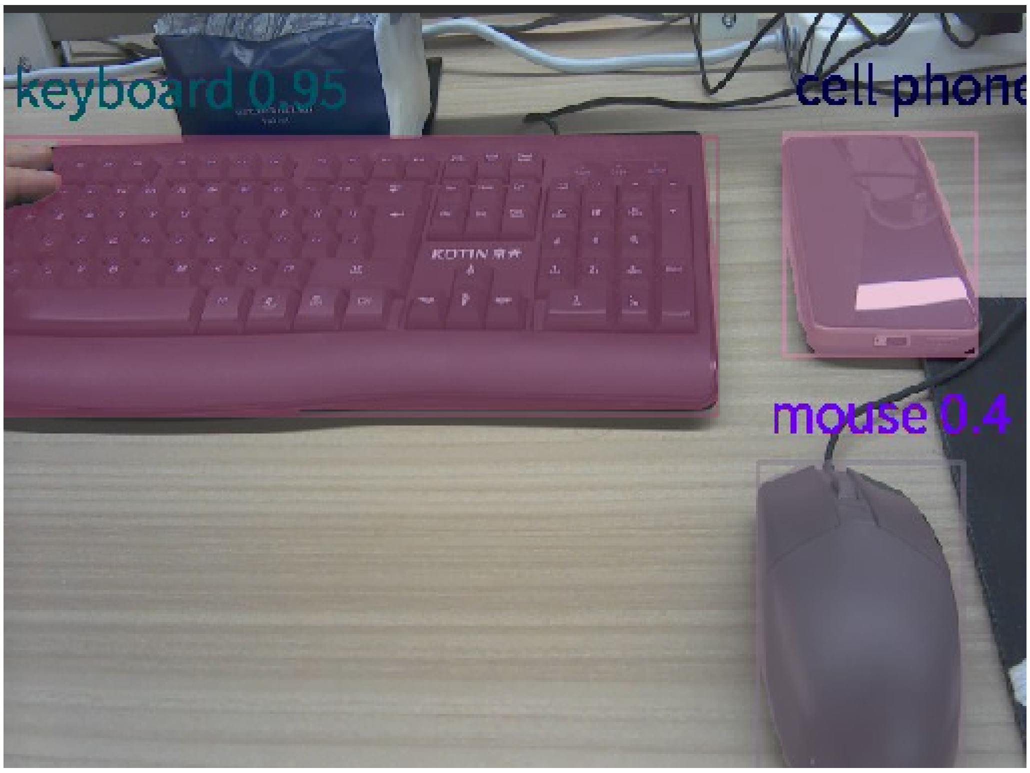
yolov8n segmentation

Routine Experiment Effect

In this section, we will learn how to use K230 to implement object segmentation based on yolov8n.

After connecting to the IDE, run the sample code in this section and use K230 to focus on the surroundings. You can see that based on the object detection, the detected object area will be rendered with different colors.



Code Explanation

Code structure

Since segmentation is based on detection, here we mainly list the differences in code structure from the detection in the previous section.

1. Added segmentation model-specific initialization phase, including mask array initialization
2. Modified the detection process to detection and segmentation process, added mask generation step

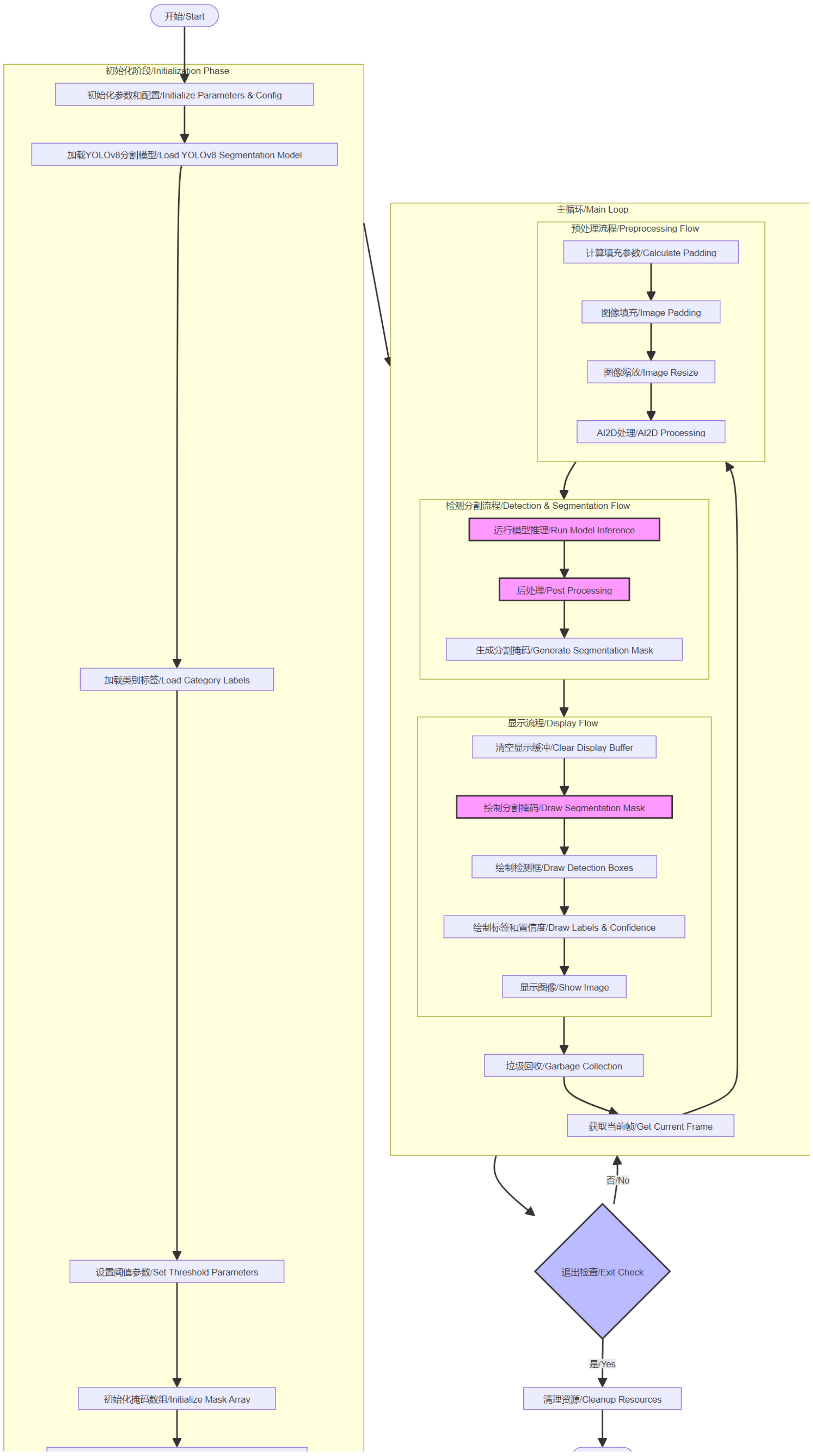
3. Added segmentation mask drawing step to display pipeline
4. Adjusted the order and relationship of each sub-process in the main loop

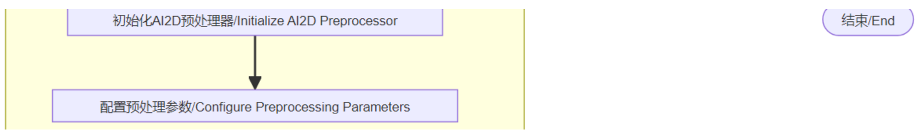
Part of the code

For the complete code, please refer to the file [Source Code/09.Scene/04.segment_yolov8n.py]

```
    def postprocess(self, results):
        """
        自定义当前任务的后处理
        Custom post-processing for the current task

        参数:
        Parameters:
            results: 模型推理结果 / Model inference results

        返回:
        Returns:
            seg_res: 分割结果 / Segmentation results
        """
        with ScopedTiming("postprocess", self.debug_mode > 0):
            # 这里使用了aidemo的segment_postprocess接口进行后处理
            # Using aidemo's segment_postprocess interface for post-processing
            seg_res = aidemo.segment_postprocess(
                results,
                [self.rgb888p_size[1], self.rgb888p_size[0]],
                self.model_input_size,
                [self.display_size[1], self.display_size[0]],
                self.confidence_threshold,
                self.nms_threshold,
                self.mask_threshold,
                self.masks
            )
            return seg_res

    def draw_result(self, pl, seg_res):
        """
        绘制分割结果到显示层
        Draw segmentation results to display layer

        参数:
        Parameters:
            pl: Pipeline对象 / Pipeline object
            seg_res: 分割结果 / Segmentation results
        """
        with ScopedTiming("display_draw", self.debug_mode > 0):
            if seg_res[0]:  # 如果有检测到物体 / If objects are detected
                pl.osd_img.clear()  # 清除OSD图层 / Clear OSD layer
                # 创建引用mask数据的图像对象 / Create image object referencing mask
data
                mask_img = image.Image(self.display_size[0],
self.display_size[1], image.ARGB8888, alloc=image.ALLOC_REF, data=self.masks)
                pl.osd_img.copy_from(mask_img)  # 复制mask图像到OSD层 / Copy mask
image to OSD layer

                # 提取检测结果 / Extract detection results
                dets, ids, scores = seg_res[0], seg_res[1], seg_res[2]
                for i, det in enumerate(dets):
                    # 绘制标签和置信度 / Draw label and confidence
                    x1, y1, w, h = map(lambda x: int(round(x, 0)), det)
                    pl.osd_img.draw_string_advanced(
                        x1, y1-50, 32,
                        " " + self.labels[int(ids[i])] + " " +
str(round(scores[i], 2)),
                        color=self.get_color(int(ids[i]))
                    )
            else:
                pl.osd_img.clear()  # 没有检测结果时清除OSD / Clear OSD when no
detection
```

flow chart


开始/Start
初始化阶段/Initialization Phase
初始化参数和配置/Initialize Parameters & Config
加载YOLOv8分割模型/Load YOLOv8 Segmentation Model
加载类别标签/Load Category Labels
设置阈值参数/Set Threshold Parameters
初始化掩码数组/Initialize Mask Array
主循环/Main Loop
预处理流程/Preprocessing Flow
计算填充参数/Calculate Padding
图像填充/Image Padding
图像缩放/Image Resize
AI2D处理/AI2D Processing
检测分割流程/Detection & Segmentation Flow
运行模型推理/Run Model Inference
后处理/Post Processing
生成分割掩码/Generate Segmentation Mask
显示流程/Display Flow
清空显示缓冲/Clear Display Buffer
绘制分割掩码/Draw Segmentation Mask
绘制检测框/Draw Detection Boxes
绘制标签和置信度/Draw Labels & Confidence
显示图像/Show Image
垃圾回收/Garbage Collection
获取当前帧/Get Current Frame
否/No
退出检查/Exit Check
是/Yes
清理资源/Cleanup Resources


初始化AI2D预处理器/Initialize AI2D Preprocessor
配置预处理参数/Configure Preprocessing Parameters
结束/End