

# 时空感知大数据的人工智能分析

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## 基于深度学习的图像识别



## 基于深度学习的视频结构化分析



处理速度：  
10~40倍

检测率：  
>99%

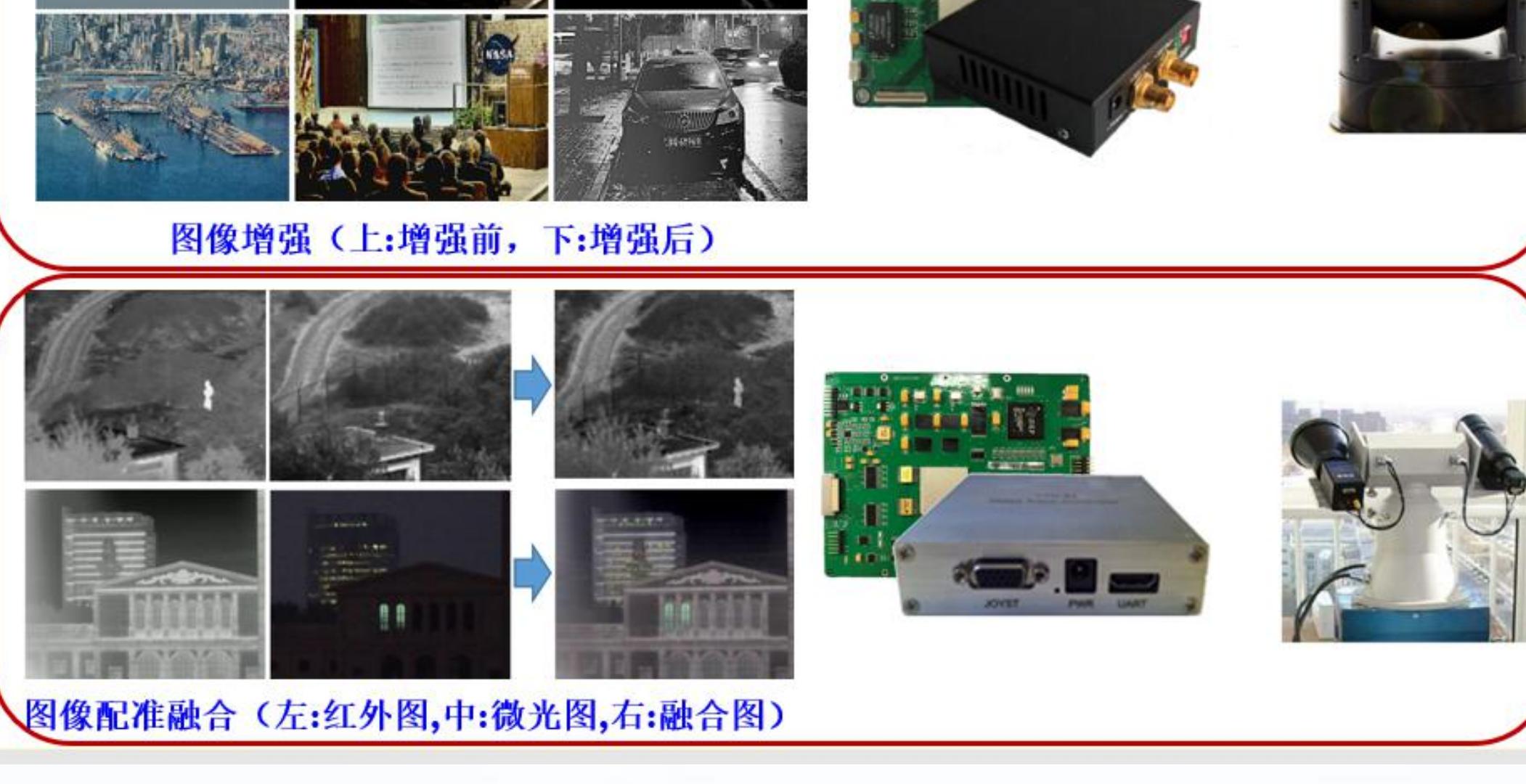
分类率：  
>98%

虚警率：  
<5%

检索率：  
TOP50 > 95%



## 视频实时预处理技术



## 多源信息融合的表情识别

提出的基于AU描述的融合方法应用在表情识别上，识别率达到90%以上



在公共表情数据集CK和Caffe上实验取得了多种评价指标高于主流方法的实验结果，基本表情识别率达到94%以上

Table 11. Comparison with existing methods on CK database.

Reference	Accuracy	Method
Cohen et al. (2003) [38]	77.2%	Geometric feature + two-layered NB
Bartlett et al. (2005) [39]	81.7%	Gabor filters + Support Vector Machine
Sohn et al. (2007) [40]	82.1%	ASM + geometry feature + SVM classifier
Xu et al. (2009) [41]	80.1%	ASM + geometry feature + SVM classifier
Jia et al. (2010) [42]	80.7%	ASM + geometry feature + SVM classifier
Tian et al. (2010) [43]	92.7%	ASM + geometry feature + SVM classifier
Chen et al. (2010) [44]	92.7%	ASM + geometry feature + SVM classifier
Deng et al. (2010) [45]	92.7%	ASM + geometry feature + SVM classifier
Our proposed approach	<b>96.82%</b>	Multilayer of optimally weighted AU
Peng et al. (2011) [46]	92.3%	ASM + geometry feature + SVM classifier
Deepak Ghose et al. (2013) [23]	97.35%	SVM on boosted features

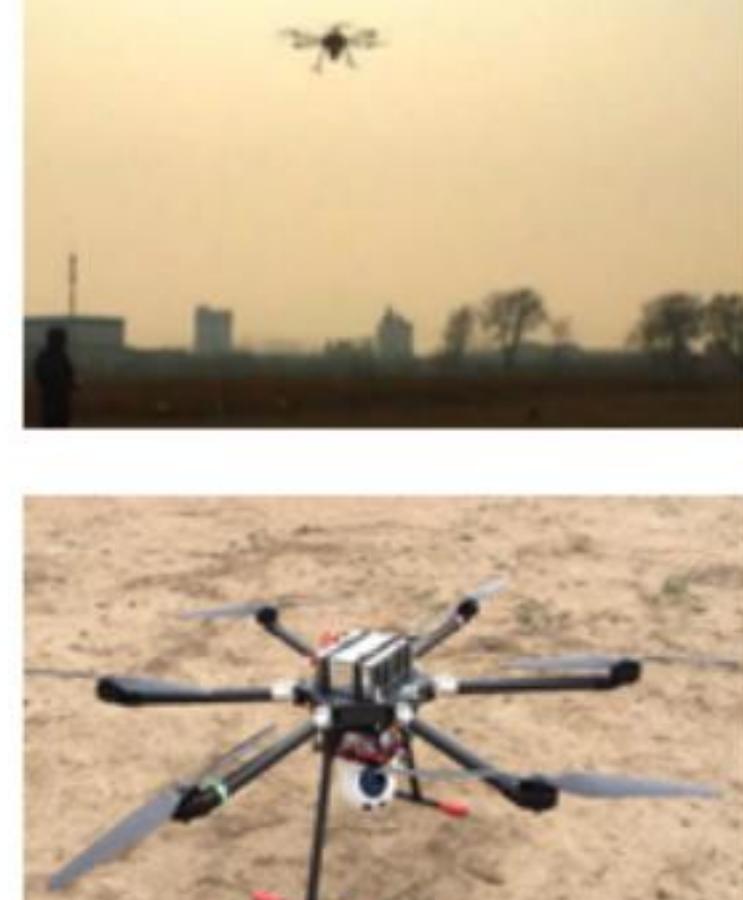
Table 12. Comparison with existing methods on LFW database.

Reference	Accuracy	Method
Bartlett et al. (2005) [42]	80.1%	Gabor filters + Learning Vector Quantization (LVQ)
Kotsopoulos et al. (2007) [43]	92.3%	Gabor filters + artificial neural networks
Yu et al. (2010) [44]	85.7%	WLSD + pool + SVM
Hoppe et al. (2010) [45]	85.9%	Local binary patterns + linear and logistic classifier selection (LBPCS)
Fan et al. (2010) [46]	92.3%	Convolutional Sparse Network & CNN
Jia et al. (2010) [47]	92.3%	Gabor filters + stacking
Peng et al. (2011) [48]	93.0%	Boosted deep belief network
Our proposed approach	<b>94.87%</b>	Multi-layer of optimally weighted AU

## 多旋翼无人机目标识别、定位、地理匹配技术

### 地面控制平台

抗风能力不大于7级，载荷20公斤，飞行速度最大15米/秒，收放起落架，配置降落伞

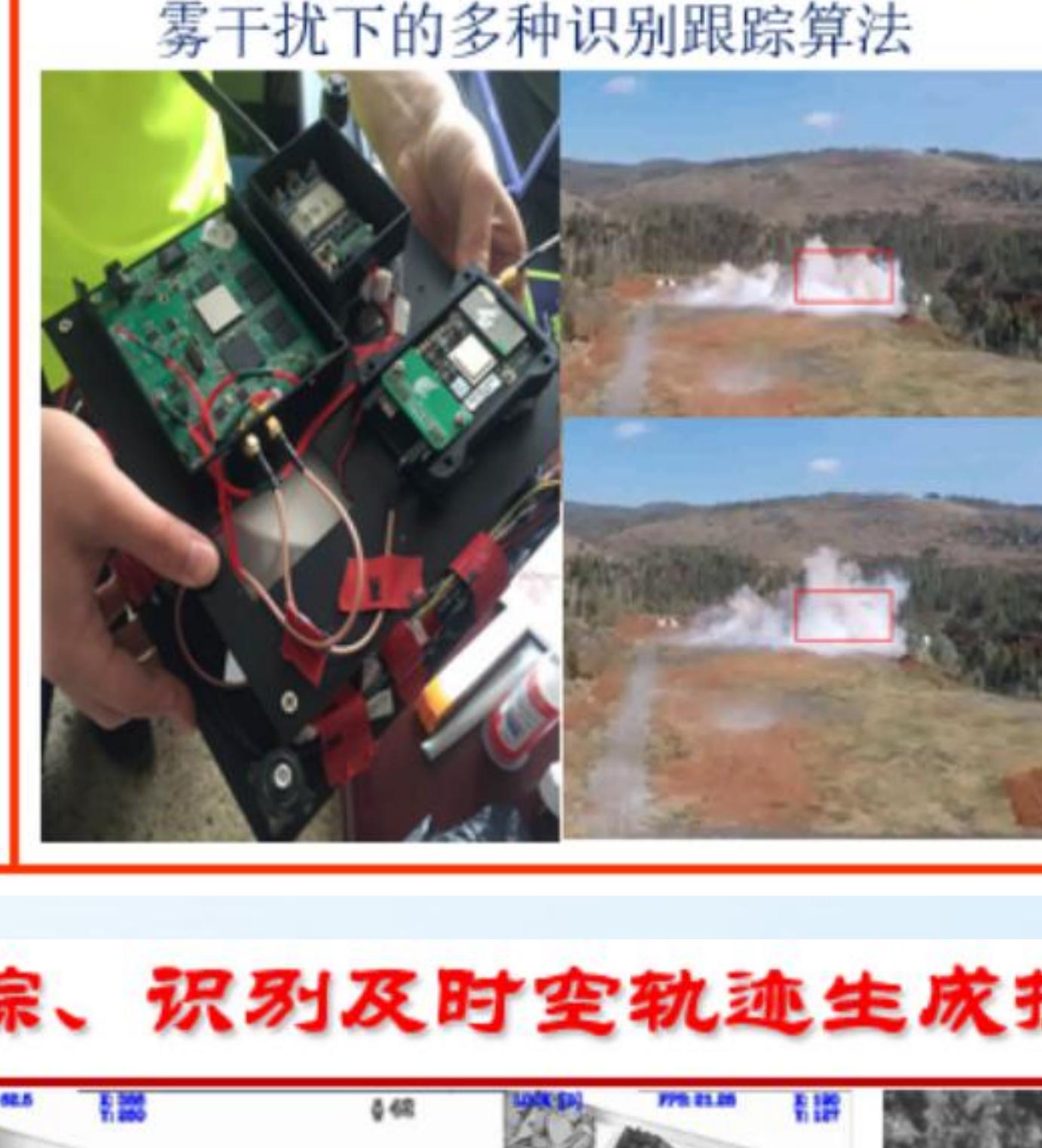


- 图传接收与控制软件一体控制数传和任务数传分别进行飞行控制和任务控制
- 220V交流输入，内置锂电池自动充电；军用防爆

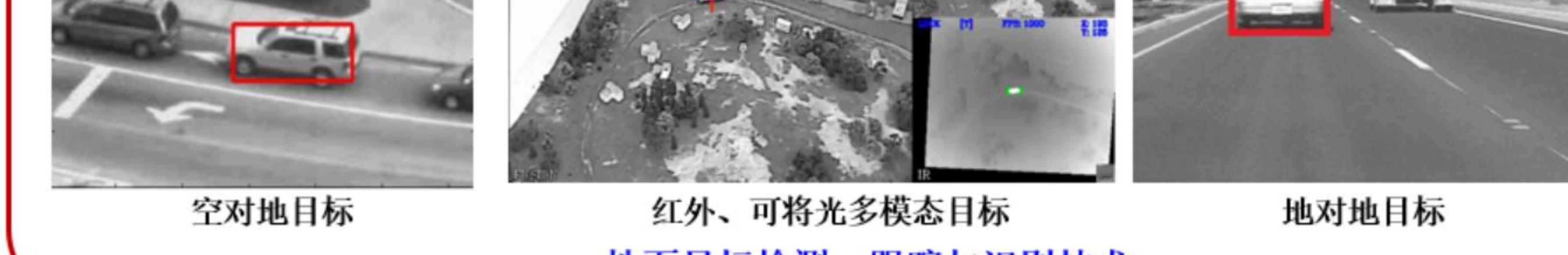


### 图像识别、跟踪与定位、地理匹配

- 自主图像处理平台：Xilinx ZYNQ 7020+TI 6657双核DSP，实时处理红外和可见光图像，实时完成各类目标识别、跟踪和目标定位功能
- 针对地面目标、移动车辆、建筑物、空中移动目标，具备多光谱及烟雾干扰下的多种识别跟踪算法



## 目标检测、跟踪、识别及时空轨迹生成技术



### 地面对目标检测、跟踪与识别技术



### 海面舰船目标检测、跟踪、识别技术