Wavesys Video Content Analytics (WVCA) Software A&E Specifications

Rev. 21_05_20.1

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 20 00 Video Surveillance

28 23 11 Video Management System Analytics

PART 1 – GENERAL – NOT USEDPART 2 –

PRODUCT

2.01 SOFTWARE / EQUIPMENT

A. Manufacturer: Wavesys Global

www.wavesysglobal.com

B. Model/Version: Wavesys server & higher

2.02 DESCRIPTION / OVERVIEW

A. Video Content Analytics (WVCA) software shall not record video.

B. WVCA software shall support metadata streaming for tracked objects on allchannels.

C. WVCA software with AI / Deep Learning capabilities shall analyze IP video streams to track, classify and create rules against objects in the field of view.

D. WVCA software shall support any combination of basic rules and filters with conditional rules (And, Or, etc) to create new, application-specific rules & alerts.

E. WVCA software shall support actions/event notifications and metadata access to third party software applications via:

1. Email notification with configurable JPEG snapshots
2. HTTP notification with configurable JPEG snapshot
3. TCP notification
4. System Arm/Disarm – Enable/Disable all configured actions
5. JSON format Metadata via:
    a. SSE
    b. RTSP metadata stream
    c. Template tokens

F. WVCA software shall be deployable on existing or new x86-64 & ARMv8 hardwareand VM environments.

G. WVCA software shall be deployable on Windows (Windows 10+) and Linux(Ubuntu 18.04+) operating systems.

H. WVCA software shall support HTML5 user interface accessible via Google Chrome and Chromium based web browsers.

I. WVCA software shall support responsive design UI for smooth access from any size screen/device.

J. WVCA software shall not require a dedicated client application to access, configure or monitor WVCA events or streams.

K. WVCA software shall support fully documented REST APIs and SDK.

2.03 SYSTEM - FUNCTIONS & CAPABILITIES

A. WVCA software shall support GPU acceleration for deep learning and AI features.

B. WVCA software shall intelligently detect GPU availability and, in the absence of a GPU, default to running deep learning features on the CPU, where possible.

C. WVCA software shall disable algorithm(s) with mandatory GPU requirements when no GPU is detected.

D. WVCA software shall provide the following GPU monitoring services:

1. Vendor
2. Temperature
3. Utilization
4. Memory

E. WVCA software shall support GPU utilization alerts based on user defined thresholds.

F. WVCA software shall support backup, import and export of system configuration parameters in JSON format.

G. WVCA software shall support an always-on recovery service with access to logs, configurations, failure counts and system status.

H. WVCA software shall support the following types of inputs/sources:

1. File – Prerecorded video files
2. RTSP video stream – Support for ‘keep-alive’ and ‘RTP over TCP’ streaming
3. HTTP source – Virtual input via HTTP
4. Schedule source - Set granular time schedules for rules
5. Interval – Generate system notification in user defined time intervals
6. Armed/Disarmed – Generate system notification for armed state changes

I. WVCA software shall support the following compression standards for video inputs/sources:

1. MPEG4 2. H.264 3. H.265

4. AV1

J. WVCA software shall support video input resolutions ranging from QCIF up to 2 Megapixels

K. WVCA software shall support video input frame rates of 15 frames per second or greater.

L. WVCA software shall support ONVIF profile S endpoints for the following services:

1. Discovery – device information, supported services
2. Events – last 100 actions the device has sent
3. User Management – ONVIF password change

M. WVCA software shall support the following, user selectable annotations to be ‘burnt-in’ to the video stream for all channels:

1. Display Event Log
2. Display System Messages
3. Display Zones
4. Display Line Counters
5. Display Counting Lines
6. Display DL Classification
7. Display Pose Estimation Annotations
8. Display Colour Signature

9. Display Objects

a. Object Speed

b. Object Height

c. Object Area

d. Object Class

N. WVCA software shall allow enabling/disabling and customization of the default parameters for the following features:

1. Colour Signature

2. Alarm Hold-off Time

3. Stationary Object on Hold Time

4. Minimum Tracked Object Size

5. Detection Point of Tracked Objects

6. Loss of Signal Emit Interval

7. Scene Change Detection

8. Tamper Detection

O. WVCA software shall support the following metadata definitions to be customized for third party applications:

1. Normalized coordinate range maximum

2. Flip Y axis coordinates

3. Round coordinates to nearest integer

P. WVCA software shall include an RTSP server to stream annotated video to third party applications.

Q. WVCA software shall include an channel snapshot service providing annotated images to third party applications on demand.

2.04 WAVESYS VIDEO CONTENT ANALYTICS (WVCA) - FUNCTIONS & CAPABILITIES

A. WVCA software shall support up to 40 user defined zones and lines per channel.

B. WVCA software shall support detection and non-detection zones.

C. WVCA software shall support multi-segmented lines.

D. WVCA software shall support 10 user selectable color options for zones and lines

E. WVCA software shall support the following object tracking engines:

1. Object Tracker – CPU only

2. Deep Learning People Tracker - GPU only

3. Deep Learning Object Tracker - GPU only

F. WVCA software shall support blob map annotations and sensitivity setting for the object tracking engine.

G. WVCA software shall support real-time tracking of up to 100 objects per channel.

H. WVCA software shall support 3D calibration via an on screen virtual grid and human figurines for accurate tracking, classification and speed measurement.

I. WVCA software shall support bounding boxes and trail paths for all tracked objects.

J. WVCA software shall support object trails based on center or mid-bottom of bounding boxes to compensate for different fields of view on video streams.

K. WVCA software shall support red bounding boxes and trail paths for objects that have triggered an action/event.

L. WVCA software shall support classification of objects by area and speed.

M. WVCA software shall support classification of objects by Deep Learning models.

N. WVCA software shall support algorithms consisting of basic rules, filters and conditional rules to create customized, application specific rules.

1. WVCA software shall support the following basic rules:

a. Abandoned

b. Appear

c. Deep Learning Presence

d. Direction

e. Disappear

f. Dwell (Loiter)

g. Enter

h. Exit

i. Presence

j. Stopped

k. Tailgating

l. Counting Line

2. WVCA software shall support the following filters:

a. Object

b. Color

c. Speed

d. Deep Learning

e. HTTP Source

f. Schedule Source

3. WVCA software shall support the following conditional rules:

a. And

b. Or

c. Not

d. Continuously

e. Previous

f. Counter

O. WVCA software shall support concurrent rules running on the same channel, zone or overlapping zones.

P. WVCA software shall support user selectable triggering of actions by all rules, filters and conditional rules.

Q. WVCA software shall support user selectable triggering of actions on a ‘per target’

basis for each rule.

R. WVCA software shall support configuration and visualization of rules via logical graph view.

S. WVCA software shall support configuration and visualization of rules via docked view with live video stream

T. WVCA software shall support

2.05 AI / DEEP LEARNING (DL) - FUNCTIONS & CAPABILITIES

A. WVCA software shall support deep learning models for classification in the form of the Deep Learning (DL) filter.

1. WVCA software DL filter shall be deployable on CPU or CPU/GPU hardware.
2. WVCA software DL filter shall utilize classification models built on physical security video datasets.
3. WVCA software DL filter shall support person and vehicle classes.
4. WVCA software DL filter shall support addition of new classifications/models.
5. WVCA software DL filter shall support user definable confidence thresholds for each class.
6. WVCA software DL filter shall support each classification to be user selectable for triggering actions/events.
7. WVCA software DL filter shall filter out all tracked objects that do not conform to user selected classification(s) and defined confidence thresholds.
8. WVCA software DL filter shall not require calibration.
9. WVCA software DL filter shall be able to trigger actions in standalone use.
10. WVCA software DL filter shall be usable in combination with basic rules, filters and conditional rules.
11. WVCA software DL filter shall be deployable independently or in combination with the Object filter.
12. WVCA software shall support DL presence rule to assign DL filter to customer defined zone/line and trigger actions.

B. WVCA software shall support a deep learning tracking engine dedicated to tracking persons in the form of the Deep Learning (DL) People Tracker.

1. WVCA software DL People Tracker shall be deployable on GPU hardware only.
2. WVCA software DL People Tracker shall support video input frame rates of 15 frames per second and higher.
3. WVCA software DL People Tracker shall support video resolutions of 480P or greater.
4. WVCA software DL People Tracker shall not require calibration.
5. WVCA software DL People Tracker shall be usable in combination with all basic rules, filters and conditional rules.
6. WVCA software DL People Tracker shall support all system actions/event notifications.
7. WVCA software DL People Tracker shall generate skeletal metadata for tracked persons.
8. WVCA software DL People Tracker shall generate face point metadata (comprised of a subset of the skeletal metadata) for tracked persons.
9. WVCA software DL People Tracker shall track up to 18 skeletal data points including:

a. Right & Left Ear
b. Right & Left Eye
c. Nose
d. Right & Left Shoulder
e. Right & Left Elbow
f. Right & Left Hand
g. Centre Chest
h. Right & Left Hip
i. Right & Left Knee

10. WVCA software DL People Tracker shall assign unique numeric ID to each person being tracked whilst in the camera field of view.
11. WVCA software DL People Tracker shall support streaming of anonymized metadata for all tracked persons and respective skeletal data points.

C. WVCA software shall support a deep learning tracking engine dedicated to tracking objects in the form of the Deep Learning (DL) Object Tracker.

1. WVCA software DL Object Tracker shall be deployable on GPU hardware only.
2. WVCA software DL Object Tracker shall support video input frame rates of 15 frames per second and higher.
3. WVCA software DL Object Tracker shall support video resolutions of 480P or greater.
4. WVCA software DL Object Tracker shall not require calibration.
5. WVCA software DL Object Tracker shall be usable in combination with all basic rules, filters and conditional rules.
6. WVCA software DL Object Tracker shall support all system actions/event notifications.
7. WVCA software DL Object Tracker support person and vehicle classes.
8. WVCA software DL Object Tracker shall assign a unique, numeric ID to each tracked object whilst in the camera field of view.

D. WVCA software shall support a deep learning tracking engine dedicated to tracking objects in the form of the Deep Learning (DL) Object Tracker.

1. WVCA software DL Object Tracker shall be deployable on GPU hardware only.
2. WVCA software DL Object Tracker shall support video input frame rates of 10 frames per second and higher.
3. WVCA software DL Object Tracker shall support video resolutions of 480P or greater.
4. WVCA software DL Object Tracker shall not require calibration.
5. WVCA software DL Object Tracker shall be usable in combination with all basic rules, filters and conditional rules.
6. WVCA software DL Object Tracker shall support all system actions/event notifications.
7. WVCA software DL Object Tracker shall detect and track objects including:

a. Person

b. Car

c. Van (including mini-vans, mini-buses and buses)

d. Truck (including lorries and commercial work vehicles)

e. Motorcycle

f. Bicycle

g. Cyclist

h. Bag (including backpacks and holdalls)

8. WVCA software DL Object Tracker shall assign a unique numeric ID to each person being tracked whilst in the camera field of view.
9. WVCA software DL Object Tracker shall support streaming of anonymized metadata for all tracked objects.

END OF SECTION

PART 3 EXECUTION – NOT USED