General

ID[1]				
Use case name	Use of robotic solution for traffic policing and control			
Application domain	Security			
Deployment model	On-premise systems			
Status	PoC			
Scope[2]	Robotics based traffic policing system			
Objective(s)	Efficient traffic control through use of Humanoid robots for traffic control.			
Narrative	Short description (not more than 150 words)	Creation of a humanoid robot which can be deployed for traffic monitoring and control on roads. The solution will use computer vision and will be enabled with IOT for centralized control and data collection. This will relieve the human police from working in polluted environment.		
	Complete description	Traffic police needs to stand for long hours in polluted environment which creates stress, other health related issues and may reduce his performance. A humanoid robot equipped with computer vision and IOT can be effectively deployed for effective traffic control. A robotic system can work continuously without any fatigue. This system will be centrally controlled and real time data collected can be used to bring efficiency in traffic control.		
Stakeholders[3]				
Stakeholders' assets, values[4]				
System's threats and vulnerabilities[5]				
Key performance indicators (KPIs)	ID	Name	Description	Reference to mentioned use case objectives
	1	Accuracy of Instructions	The instructions provided by the robot for controlling traffic on various roads.	The controlling instructions should be accurate as per specific traffic conditions.
	2	Response Time	The response required to react to changing traffic condition.	Response time should be minimal (real time) for effective traffic control.
	3	Data collection & control	The robotic system should accurately collect various traffic conditions such as number of vehicles, speed etc. for effective control	The traffic data collected should be accurate for generation of effective control instructions.
AI features	Task(s)	Recommendation		

	Method(s)[6]	Machine Learning, Statistics, Heuristics, Anomaly Detection (Distance / Density based). Artificial Intelligence, Machine Learning, Statistics, Heuristics,Anomaly Detection, Pattern recognition, Computer Vision
	Hardware[7]	IoT enabled and AI powered Humanoid robots.
	Topology[8]	
	Terms and concepts used[9]	Automation, Machine Learning, Computer Vision
Standardization opportunities/ requirements		
Challenges and issues	The problem is challenging because accurate control instructions is crucial for proper traffic control.	
Societal concerns	Description	Addresses the pressing concern of effective traffic control.
	SDGs[10]	Sustainable cities and communities

Data (optional)

Data characteristics	
Description	
Source[11]	
Type[12]	
Volume (size)	
Velocity (e.g. real time)[13]	
Variety (multiple datasets)[14]	
Variability (rate of change)[15]	
Quality[16]	

Process scenario (optional)

Scenario conditions					
No.	Scenario name	Scenario description	Triggering event	Pre-condition[17]	Post-condition[18]

Training (optional)

Scenario name	Training				
Step No.	Event[19]	Name of process/Activity[20]	Primary actor	Description of process/activity	Requirement

Specification of training data[21]	

Evaluation (optional)

Scenario name	Evaluation				
Step No.	Event[22]	Name of process/Activity[23]	Primary actor	Description of process/activity	Requirement

Input of evaluation[24]	
Output of evaluation[25]	

Execution (optional)

Scenario name	Execution				
Step No.	Event[26]	Name of process/Activity[27]	Primary actor	Description of process/activity	Requirement

Input of Execution[28]	
Output of Execution[29]	

Retraining (optional)

Scenario name	Retraining				
Step No.	Event[30]	Name of process/Activity[31]	Primary actor	Description of process/activity	Requirement

Specification of retraining data[32]	

References

[1] J. Zhang, T. Gao, Z. G. Liu, Traffic Video Based Cross Road Violation Detection, In Proc, 2009, International Conference on Measuring Technology and Mechatronics Automation (ICMTMA), Vol.3, pages 645-648, April 2009.
[2] D. W. Lim, S. H. Choi, J. S. Jun, Automated detection of all kinds of violations at a street intersection using real time individual vehicle tracking, Image Analysis and Interpretation, 2002. Proceedings. 5th IEEE Southwest Symposium, pages 126-129, 2002.
[3] Y. Chen, C. Yang, Vehicle red-light violation detection base on region, Computer Science and Information Technology (ICCSIT), 2010 3rd IEEE International Conference, Vol. 9, pages 700-703, July 2010.
[4] P. KaewTraKulPong and R. Bowden, An improved adaptive background mixture model for real time tracking with shadow detection, In Proc. 2nd European Workshop on Advanced Video Based Surveillance Systems, AVBS01, Sept 2001.

Footnote

[1] Leave this cell blank.

[2] The scope defines the limits of the use case.

[3] Stakeholder involved in the scenario - examples are: type of organization; customers, 3rd parties; end users; humans; environment; negative stakeholders (attackers, criminals, etc).

[4] Assets and values that are valuable to the stakeholders and at the risk of being compromised by the AI system deployment – examples can include competitiveness; reputation or trust; fairness; safety; privacy; stability; etc.

[5] Threats and vulnerabilities can compromise the assets and values above. Examples are: different sources of bias; incorrect AI system use; new security threats; challenges to accountability; new privacy threats (hidden patterns).

[6] AI method(s)/framework(s) used.

[7] Hardware system used.

[8] Topology is the study of geometric forms differentiated by intersection and bifurcation. The term is used for the graphic aspects network architectures.

[9] Terms and concepts listed here can be used to extend the work of WG 1 (AWI 22989 and AWI 23053) as necessary.

[10] The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a collection of 17 global goals set by the United Nations General Assembly. SDGs are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.
See URL for more details: http://www.undp.org/content/undp/en/home/sustainable-development-goals.html

[11] Origin of data, which could be from instruments, IoT, web, surveys, commercial activity, or from simulations.

[12] Structured/unstructured Images, voices, text, gene sequences, and numerical. Composite: time-series, graph-structured

[13] The rate of flow at which the data is created, stored, analysed, or visualized.

[14] Data from a number of domains and a number of data types. The wider range of data formats, logical models, timescales, and semantics complicates the integration of the variety of data.

[15] Changes in data rate, format/structure, semantics, and/or quality.

[16] Completeness and accuracy of the data with respect to semantic content as well as syntactical of the data (such as presence of missing fields or incorrect values)

[17] Describe which condition(s) should have been met before this scenario happens.

[18] Describe which condition(s) should prevail after this scenario happens. The post-condition may also define "success" or "failure" conditions.

[19] The event that triggers the step. This might be completion of the previous event.

[20] Action verbs should be used when naming activity.

[21] Training data can be further specified.

[22] The event that triggers the step. This might be completion of the previous event.

[23] Action verbs should be used when naming activity.

[24] Specify input of evaluation.

[25] Specify output of evaluation.

[26] The event that triggers the step. This might be completion of the previous event.

[27] Action verbs should be used when naming activity.

[28] Specify input of evaluation.

[29] Specify output of evaluation.

[30] The event that triggers the step. This might be completion of the previous event.

[31] Action verbs should be used when naming activity.

[32] Retraining data can be further specified.