1. Your System Name

EU_OTHER_SIEMENS_AI-RadCompanion

2. AI Algorithm Description:

The AI Algorithms used are capable of the following:

Organ segmentation (Lung, Lung Lobe, Heart, Aorta, Vertebra), Calcium detection, Lung nodule detection, Pulmonary Density calculation, Emphysema detection

3. DICOM IODs implemented:

SOP Class Name	SOP Class UID
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Comprehensive 3D SR Storage	1.2.840.10008.5.1.4.1.1.88.33

Note:

1. Value 4 DICOM tag (0008,0008) CS Image Type is used in the secondary capture result series to indicate the projection type of the reconstructed objects, namely
   - MPR_THICK
   - CVRT

4. Result Primitives Encoded:

5. If you encode **measurements**, indicate whether your measurements reflect a planar region of an image (i.e. use TID 1411, a volume (TID 1410), or are measurements that are not tied to a planar region or volume (TID 1501). (Refer to RAD TF-3: 6.5.3.3 in the AIR TI Supplement for details.)

6. If you encode **regions**, indicate whether they are contour-based regions (i.e. use TID 1410 or 1411) or pixel/voxel-based regions (i.e. use the DICOM Segmentation Storage SOP Class) (Refer to RAD TF-3: 6.5.3.5 for details).

AI-Rad Companion Chest CT will generate the results in the form of Comprehensive 3D DICOM SR represented in TID 1500 Measurement Report format. Please see the below tables for an overview of DICOM attributes and their values corresponding to this Measurement Report template.

Table 1 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
		CONTAINER	EV (126000, DCM, "Imaging Measurement Report")	Imaging Measurement Report	1500
>	HAS CONCEPT MOD	CODE	EV (113011, DCM, “Document Title Modifier”)	(“CHESTCT0999”, “99SHSAIRC”, “AI-Rad CT Lung Lesion”/”AI-Rad CT Lung	2010

				Parenchyma"/"AI-Rad CT Cardio"/"AI-Rad CT Vascular Aorta"/"AI-RAD CT Spine"/"AI-Rad CT Pulmonary Density")	
>	HAS CONCEPT MOD	CODE	EV ("121049", "DCM", "Language of Content Item and Descendants")	("eng", "RFC5646", "English")	1204
>>	HAS CONCEPT MOD	CODE	EV ("121046", "DCM", "Country of Language")	("US", "ISO3166_1", "United States")	1204
>	HAS CONCEPT MOD	CODE	EV ("121058", "DCM", "Procedure Reported")	("24627-2", "LN", "CT Chest")	1500
>	CONTAINS	CONTAINER	EV ("111028", "DCM", "Image Library")		1600
>>	CONTAINS	CONTAINER	EV ("126200", "DCM", "Image Library Group")		1600
>>>	HAS ACQ CONTEXT	CODE	EV ("121139", "DCM", "Modality")	("CT", "DCM", "Computed Tomography")	1602
>>>	HAS ACQ CONTEXT	DATE	EV ("111060", "DCM", "Study Date")	Copied from input image	1602
>>>	HAS ACQ CONTEXT	TIME	EV ("111061", "DCM", "Study Time")	Copied from input image	1602
>	CONTAINS	CONTAINER	EV ("126010", "DCM", "Image Measurements")		1500
>>	CONTAINS	CONTAINER	EV ("125007", "DCM", "Image Measurement Group")		1411

Table 2 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT Lesion

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 1 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. Lesion, If more than one lesions are found then identifier is named as L1, L2 etc. 2. "No findings" if there are no lesions detected	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique Identifiers	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. ("RID50149", RADLEX, "Pulmonary nodule"). 2. ("AIRAD007", 99CT, "No lesion found in input data or all results rejected") 3. ("AIRAD007", 99CT, "algorithm failed: no lesion results available")	1411
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID1302", RADLEX, "Right lung") 2. ("RID1326", RADLEX, "Left lung") 3. ("RID1327", RADLEX, "Upper lobe of left lung") 4. ("RID1338", RADLEX, "Lower lobe of left lung") 5. ("RID1303", RADLEX, "Upper lobe of right lung")	1419

				6. (“RID1310”, RADLEX, “Middle lobe of lung”) 7. (“RID1315”, RADLEX, “Lower lobe of right lung”) 8. (“RID1301”, RADLEX, “Lung”) 9. (“39607008”,SCT, “Both lungs”)	
>>>	HAS OBS CONTEXT	TEXT	EV (CHESTCT0102,99SHSAIRC,"Lesion Review Status")	Autoconfirmed/Confirmed/TobeConfirmed/ TobeReviewed.	
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers to result image SOP Instance UID	1411
>>>	CONTAINS	NUM	EV (103339001, SCT, “Maximum 2D diameter“)	UNITS = EV (mm,UCUM,milimeter)	
>>>>	INFERRED FROM	SCOORD		Graphic data (0070, 0022) and Graphic type (0070,0023) atrributes are added.	320
>>>	CONTAINS	NUM	EV (AIRAD101, 99CT, “Maximum 3D diameter“)	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (103340004, SCT, “Maximum perpendicular 2D diameter”)	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (RID50155, RADLEX, “Mean 2D diameter”)	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (RID28668, RADLEX, “Volume”)	UNITS = EV (mm3,UCUM,cubic milimeter)	
>>>	CONTAINS	Text	EV (121106, DCM, “Comment”)	A warning indicating that slice thickness is outside optimum range would be added in case slice thickness of input data is >2.5 mm for US Institutes.	1410
>	CONTAINS	CONTAINER	EV (126011, DCM, Derived Imaging Measurements)		1420
>>	CONTAINS	NUM	EV (CHESTCT0103, 99SHSAIRC, Maximum 2D Diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	CONTAINS	NUM	EV (CHESTCT0104, 99SHSAIRC, Maximum 3D diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	CONTAINS	NUM	EV (CHESTCT0105, 99SHSAIRC, Maximum perpendicular 2D diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	CONTAINS	NUM	EV (CHESTCT0106, 99SHSAIRC, Mean 2D diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	HAS OBS CONTEXT	NUM	EV (CHESTCT0108, 99SHSAIRC, Volume Change)	UNITS = EV (d, UCUM, Day); If volume change exceeds 999 days, then UNITS = EV(%, UCUM, Percent)	

Table 3 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT Parenchyma

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 1 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT					

>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. LeftUpperLobe / LeftLowerLobe / RightUpperLobe / RightMiddleLobe / RightLowerLobe / LeftLung / RightLung / BothLungs / Undefined / Lung Applied Range 2. “No findings“ if there is no parenchyma results detected	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifier	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. ("RID6039", RADLEX, "Low attenuation in lung") when parenchyma results were found 2. (“AIRAD007”, 99CT, “No parenchyma results available or all results rejected”) 3. (“C98451”, NCIt, “Chronic Lung Disorder”)	1411
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID1302", RADLEX, "Right lung") 2. ("RID1326", RADLEX, "Left lung") 3. (“RID1327”, RADLEX, “Upper lobe of left lung”) 4. (“RID1338”, RADLEX, “Lower lobe of left lung”) 5. (“RID1303”, RADLEX, “Upper lobe of right lung”) 6. (“RID1310”, RADLEX, “Middle lobe of lung”) 7. (“RID1315”, RADLEX, “Lower lobe of right lung”) 8. (“RID1301”, RADLEX, “Lung”) 9. (“39607008”,SCT, “Both lungs”)	1419
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers result image SOP Instance UID	1411
>>>	CONTAINS	CODE	EV (130400, DCM, “Geometric purpose of region”)	(111041, DCM, “Contour”)	1411
>>>	CONTAINS	NUM	EV (AIRAD202, 99CT, “LAV950”)	UNITS = EV (% ,UCUM,Percent)	
>>>	CONTAINS	CODE	EV (AIRAD006, 99CT, “Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	CODE	EV (AIRAD201, 99CT, “Lung Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	IMAGE	EV (121232, DCM, “Source series for segmentation”)	Original image series	1411

Table 4 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT Cardio

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 1 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. Heart/Calcium Score/Calcium Applied Range 2. “No findings“ if there are no cardiac results detected	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifier	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. (“C35552”, NCIt, “Cardio Vascular System Finding”) 2. (“AIRAD007”, 99CT, “No cardiac results available or all results rejected”)	1411
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID1385", “RADLEX”, "Heart") 2. ("C12843", "NCIt", "Coronary Artery")	1419
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers result image SOP Instance UID	1411
>>>	CONTAINS	NUM	EV (AIRAD303, 99CT, “Heart Volume”)	UNITS = EV (mL,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (AIRAD304, 99CT, “Coronary Calcium”)	UNITS = EV (mm3, UCUM,cubic milimeter)	
>>>	CONTAINS	CODE	EV (AIRAD006, 99CT, “Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	CODE	EV (AIRAD302, 99CT, “Coronary Calcium Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	

Table 5 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT Vascular

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 1 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. AorticSinus / Sinoturbularjunction / MidAscending / ProximalArch / MidArch / ProximalDescending / MidDescending / Diaphragm / Abdomina / Aorta Applied Range 2. “No Findings“, If vascular results are not found	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique Identifiers	1411

>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. (“C35552”, NCIt, “Cardio Vascular System Finding”) 2. (“AIRAD007”, 99CT, “No aorta results available or all results rejected”)	
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("C33557", NCIt, "Sinus of Valsalva") 2. ("RID579", RADLEX, "Sinotubular Junction") 3. ("AIRAD403", 99CT, "Mid Ascending Aorta") 4. ("AIRAD404", 99CT, "Proximal Aortic Arch") 5. ("AIRAD405", 99CT, "Mid Aortic Arch") 6. ("AIRAD406", 99CT, "Proximal Descending Aorta") 7. ("AIRAD407", 99CT, "Mid Descending Aorta") 8. ("AIRAD408", 99CT, "Aorta at Diaphragm") 9. ("RID905", RADLEX, "Abdominal Aorta") 10. (“RID480”, RADLEX,”Aorta”)	1419
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers to result image SOP Instance UID	1411
>>>	CONTAINS	NUM	EV (RID13432, RADLEX, “Diameter”)	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	CODE	EV (AIRAD006, 99CT, “Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	CODE	EV (AIRAD410, 99CT, “Aorta Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	

Table 6 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT Spine

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 1 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. Thoracic vertebrae labels / Spine Applied Range 2. “No Findings“, if algorithm failed to determine spine labels	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifiers	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. (“C110937”, NCIt, “Musculoskeletal Finding”)	1411

				2. (“AIRAD007”, 99CT, “No spine results available or all results rejected”)	
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID29198", "RADLEX", "First thoracic vertebra") 2. ("RID29199", "RADLEX", "Second thoracic vertebra") 3. ("RID29200", "RADLEX", "Third thoracic vertebra") 4. ("RID29201", "RADLEX", "Fourth thoracic vertebra") 5. ("RID29202", "RADLEX", "Fifth thoracic vertebra") 6. ("RID29203", "RADLEX", "Sixth thoracic vertebra") 7. ("RID29204", "RADLEX", "Seventh thoracic vertebra") 8. ("RID31704", "RADLEX", "Eighth thoracic vertebra") 9. ("RID29206", "RADLEX", "Ninth thoracic vertebra") 10. ("RID29207", "RADLEX", "Tenth thoracic vertebra") 11. ("RID29208", "RADLEX", "Eleventh thoracic vertebra") 12. ("RID29209", "RADLEX", "Twelfth thoracic vertebra") 13. ("RID29154”, “RADLEX”, "Vertebra")	1419
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers result image SOP Instance UID	1411
>>>	CONTAINS	NUM	EV (121207, DCM, “Height”)	UNITS = EV (mm,UCUM,milimeter)	
>>>>	HAS CONCEPT MOD	CODE	DT (106233006, SCT, “Topographical Modifier”)	Different codes and meanings of modifiers in RADLEX: 1. ("RID5818", RADLEX, "Anterior") 2. ("RID5820", RADLEX, "Medial") 3. (“RID5819”, RADLEX, “Posterior”)	
>>>>	HAS CONCEPT MOD	CODE	EV (AIRAD006, 99CT, “Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	NUM	EV (112031, DCM, “Attenuation coefficient”)	UNITS = EV (hnsf’U,UCUM,Hounsfield unit)	
>>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	(C53319,NCIt,”Mean”)	
>>>	CONTAINS	CODE	EV (AIRAD501, 99CT, “Spine Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	

Table 7 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT Pulmonary density

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 1 -- TID 1500 Measurement Report for Comprehensive 3D DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. LeftUpperLobe, LeftLowerLobe, RightUpperLobe, RightMiddleLobe, RightLowerLobe, LeftLung, RightLung, BothLungs, Lung 2. “Not found or Not confirmed“, if lung opacities are not found 3. “No Findings“, if algorithm failes to detect opacities in lung	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifiers	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. (“RAD28530“, DCM, “Opacities“) 2. (“AIRAD007”, 99CT, “Algorithm failed: no pulmonary density results available”) 3. (“AIRAD007”, 99CT, “Lung opacities not found or not confirmed”)	1411
>>>	HAS CONCEPT MOD	CODE	EV (31094006, SCT, “Lung lobes”)	Different Codes and Meaning of lung lobes: 1. ("RID1302", RADLEX, "Right lung") 2. ("RID1326", RADLEX, "Left lung") 3. (“RID1327”, RADLEX, “Upper lobe of left lung”) 4. (“RID1338”, RADLEX, “Lower lobe of left lung”) 5. (“RID1303”, RADLEX, “Upper lobe of right lung”) 6. (“RID1310”, RADLEX, “Middle lobe of lung”) 7. (“RID1315”, RADLEX, “Lower lobe of right lung”) 8. (“RID1301”, RADLEX, “Lung”) 9. (“39607008”,SCT, “Both lungs”)	
>>>	CONTAINS	CODE	EV (130400, DCM, “Geometric purpose of region”)	(111041, DCM, “Outline”)	1411
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers to result image SOP Instance UID	1411
>>>	CONTAINS	IMAGE	EV (121232, DCM, “Source series for segmentation”)	Original image series	1411
>>>	CONTAINS	NUM	EV (AIRAD601, 99CT, “Opacity score”)	UNITS = EV ({Number},UCUM,Number)	
>>>	CONTAINS	NUM	EV (AIRAD602, 99CT, “Total Volume”)	UNITS = EV (mL,UCUM,mililiter)	
>>>	CONTAINS	NUM	EV (AIRAD603, 99CT, “Opacity volume”)	UNITS = EV (mL,UCUM,mililiter)	
>>>	CONTAINS	NUM	EV (AIRAD604, 99CT, “Opacity percentage”)	UNITS = EV (%{vol},UCUM,VolumePercent)	
>>>	CONTAINS	NUM	EV (AIRAD605, 99CT, “High opacity volume”)	UNITS = EV (mL,UCUM,mililiter)	

>>>	CONTAINS	NUM	EV (AIRAD606, 99CT, “High opacity percentage”)	UNITS = EV (%{vol},UCUM,VolumePercent)	
>>>	CONTAINS	NUM	EV (AIRAD607, 99CT, “Mean HU total”)	UNITS = EV (hnsf’U,UCUM,Hounsfield unit)	

6. Please add any additional information (e.g. screen shots) that would help the reader understand your algorithm, and output.