

Appendix 1

Mesh terms	Artificial Intelligence Machine Learning	"Thyroid Nodule" "Thyroid Gland"	Ultrasonography computed tomography
text words	Intelligence, Artificial Computer Reasoning Artificial Intelligence Reasoning, Computer Machine Intelligence Intelligence, Machine Computational Intelligence Intelligence, Computational Computer Vision System* System, Computer Vision Systems, Computer Vision Vision System, Computer Vision Systems, Computer Learning, Machine Transfer Learning Learning, Transfer Deep learning Computer-Assisted neural network* Automated Learning, Deep	"Thyroid Nodule*" "Thyroid Gland" Thyroid "thyroid cancer" "thyroid tumour" "thyroid neoplasms" "thyroid carcinoma" Nodules, Thyroid Nodule, Thyroid	"Echotomography" "Ultrasonography" "computed tomography" "Ultrasonic Imaging" Imaging, Ultrasonic Sonography, Medical "Medical Sonography" "Ultrasound Imaging" Imagings, Ultrasound Imaging, Ultrasound "Diagnostic Ultrasound*" Ultrasound, Diagnostic Ultrasounds, Diagnostic Tomography, Ultrasonic "Ultrasonic Tomography" Diagnosis, Ultrasonic Diagnoses, Ultrasonic "Ultrasonic Diagnosis*" "Computed X-Ray Tomography" "CT Scan*"

	Hierarchical Learning		
	Learning, Hierarchical		

Pubmed search: 480 (2024:95/2023:147/2022:93/2021:78/2020:68)

(((((Ultrasonography[MeSH Terms]) OR ("computed tomography"[MeSH Terms])) OR ("Ultrasonograph*"[Title/Abstract])) OR ("computed tomography"[Title/Abstract])) OR ("Echotomography"[Title/Abstract])) OR ("Ultrasonic Imaging"[Title/Abstract])) OR ("Medical Sonography"[Title/Abstract])) OR ("Ultrasound Imaging"[Title/Abstract])) OR ("Diagnostic Ultrasound*"[Title/Abstract])) OR ("Ultrasonic Tomography"[Title/Abstract])) OR ("Ultrasonic Diagnosis*"[Title/Abstract])) OR ("Computed X-Ray Tomography"[Title/Abstract])) OR ("CT Scan*"[Title/Abstract])) OR ("Computed X-Ray Tomography"[Title/Abstract])) OR ((Imaging [tiab] AND Ultrasonic [tiab])) OR ((Sonography [tiab] AND Medical [tiab])) OR ((Imagings [tiab] AND Ultrasound [tiab])) OR ((Imaging [tiab] AND Ultrasound [tiab])) OR ((Ultrasound [tiab] AND Diagnostic [tiab])) OR ((Ultrasounds [tiab] AND Diagnostic [tiab])) OR ((Tomography [tiab] AND Ultrasonic [tiab])) OR ((Diagnosis [tiab] AND Ultrasonic [tiab])) OR ((Diagnoses [tiab] AND Ultrasonic [tiab])) AND (((("Thyroid Nodule"[MeSH Terms]) OR ("Thyroid Gland"[MeSH Terms])) OR ("Thyroid Nodule*"[Title/Abstract])) OR ("Thyroid Gland"[Title/Abstract])) OR (Thyroid[Title/Abstract])) OR ("thyroid cancer"[Title/Abstract])) OR ("thyroid tumour"[Title/Abstract])) OR ("thyroid neoplasms"[Title/Abstract])) OR ("thyroid carcinoma"[Title/Abstract])) OR ((Nodules[tiab] AND Thyroid[tiab])) OR ((Nodule[tiab] AND Thyroid[tiab])) AND (((("Artificial Intelligence"[MeSH Terms]) OR ("Machine Learning"[MeSH Terms])) OR ("Intelligence, Artificial"[Title/Abstract])) OR ("Computer Reasoning"[Title/Abstract])) OR ("Artificial Intelligence"[Title/Abstract])) OR ((Reasoning[tiab] AND Computer[tiab])) OR ("Machine Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Machine[tiab])) OR ("Computational Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Computational[tiab])) OR ("Computer Vision System*"[Title/Abstract])) OR ((System[tiab] AND Computer Vision[tiab])) OR ((Systems[tiab] AND Computer Vision[tiab])) OR ((Vision System[tiab] AND Computer[tiab])) OR ((Vision Systems[tiab] AND Computer[tiab])) OR ((Learning[tiab] AND Machine[tiab])) OR ("Transfer Learning"[Title/Abstract])) OR ((Learning[tiab] AND Transfer[tiab])) OR ("Deep learning"[Title/Abstract])) OR ("Computer-Assisted"[Title/Abstract])) OR ("neural network*"[Title/Abstract])) OR (Automated[Title/Abstract])) OR ((Learning[tiab] AND Deep[tiab])) OR ("Hierarchical Learning"[Title/Abstract])) OR ((Learning[tiab] AND Hierarchical[tiab]))

Mesh terms	Artificial Intelligence Machine Learning	"Thyroid Nodule" "Thyroid Gland"	Biopsy, Fine-Needle
text words	Intelligence, Artificial Computer Reasoning Artificial Intelligence	"Thyroid Nodule*" "Thyroid Gland" Thyroid "thyroid cancer" "thyroid tumour"	Biops*, Fine Needle "Fine Needle Biops*" "Fine Needle Aspiration*" Aspiration*, Fine-Needle

	Reasoning, Computer Machine Intelligence Intelligence, Machine Computational Intelligence Intelligence, Computational Computer Vision System* System, Computer Vision Systems, Computer Vision Vision System, Computer Vision Systems, Computer Learning, Machine Transfer Learning Learning, Transfer Deep learning Computer-Assisted neural network* Automated Learning, Deep Hierarchical Learning Learning, Hierarchical	“thyroid neoplasms” “thyroid carcinoma” Nodules, Thyroid Nodule, Thyroid	
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Pubmed search: 126 (2024:20/2023:44/2022:27/2021:19/ 2020:16)

(((((("Thyroid Nodule"[MeSH Terms]) OR ("Thyroid Gland"[MeSH Terms])) OR ("Thyroid Nodule*"[Title/Abstract])) OR ("Thyroid Gland"[Title/Abstract])) OR (Thyroid[Title/Abstract])) OR ("thyroid cancer"[Title/Abstract])) OR ("thyroid tumour"[Title/Abstract])) OR ("thyroid neoplasms"[Title/Abstract])) OR ("thyroid carcinoma"[Title/Abstract])) OR ((Nodules[tiab] AND Thyroid[tiab])) OR ((Nodule[tiab] AND Thyroid[tiab])) AND (((((((((((((((((((("Artificial Intelligence"[MeSH Terms]) OR ("Machine Learning"[MeSH Terms])) OR ("Intelligence, Artificial"[Title/Abstract])) OR ("Computer Reasoning"[Title/Abstract])) OR ("Artificial Intelligence"[Title/Abstract])) OR ((Reasoning[tiab] AND Computer[tiab])) OR ("Machine Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Machine[tiab])) OR ("Computational Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Computational[tiab])) OR ("Computer Vision System*"[Title/Abstract])) OR ((System[tiab] AND Computer Vision[tiab])) OR ((Systems[tiab] AND Computer Vision[tiab])) OR ((Vision System[tiab] AND Computer[tiab])) OR ((Vision Systems[tiab] AND Computer[tiab])) OR ((Learning[tiab] AND Machine[tiab])) OR ("Transfer Learning"[Title/Abstract])) OR ((Learning[tiab] AND Transfer[tiab])) OR ("Deep learning"[Title/Abstract])) OR ("Computer-Assisted"[Title/Abstract])) OR ("neural network*"[Title/Abstract])) OR (Automated[Title/Abstract])) OR ((Learning[tiab] AND Deep[tiab])) OR ("Hierarchical Learning"[Title/Abstract])) OR ((Learning[tiab] AND Hierarchical[tiab])) AND (((Biopsy[mh] AND Fine Needle[mh])) OR ("Fine Needle Biops*"[Title/Abstract])) OR ("Fine Needle Aspiration*"[Title/Abstract])) OR ((Aspiration*[tiab] AND Fine Needle[tiab]))))

Mesh terms	Artificial Intelligence Machine Learning	"Thyroid Nodule" "Thyroid Gland"	Genetic Marker Single-Cell Gene Expression Analysis
text words	Intelligence, Artificial Computer Reasoning Artificial Intelligence Reasoning, Computer Machine Intelligence Intelligence, Machine Computational Intelligence Intelligence, Computational Computer Vision System*	"Thyroid Nodule*" "Thyroid Gland" Thyroid "thyroid cancer" "thyroid tumour" "thyroid neoplasms" "thyroid carcinoma" Nodules, Thyroid Nodule, Thyroid	DNA Marker* RNA Marker* Marker, Genetic Genetic Marker* Single-Cell Gene Expression Analysis Biomarker Biologi* Marker Marker, Biologi* Molecular Marker Single Cell Gene Expression Single Cell Transcriptome

	System, Computer Vision		Single Cell RNA Seq*
	Systems, Computer Vision		RNA-Seq*, Single-Cell
	Vision System, Computer		Sc-RNAseq
	Vision Systems, Computer		ScRNAseq
	Learning, Machine		ScRNA-seq
	Transfer Learning		
	Learning, Transfer		
	Deep learning		
	Computer-Assisted		
	neural network*		
	Automated		
	Learning, Deep		
	Hierarchical Learning		
	Learning, Hierarchical		

Pubmed search: 127 (2024:21/2023:40/2022:29/2021:18/ 2020:19)

(((((("Artificial Intelligence"[MeSH Terms]) OR ("Machine Learning"[MeSH Terms])) OR ("Intelligence, Artificial"[Title/Abstract])) OR ("Computer Reasoning"[Title/Abstract])) OR ("Artificial Intelligence"[Title/Abstract])) OR ((Reasoning[tiab] AND Computer[tiab])) OR ("Machine Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Machine[tiab])) OR ("Computational Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Computational[tiab])) OR ("Computer Vision System"[Title/Abstract])) OR ((System[tiab] AND Computer Vision[tiab])) OR ((Systems[tiab] AND Computer Vision[tiab])) OR ((Vision System[tiab] AND Computer[tiab])) OR ((Vision Systems[tiab] AND Computer[tiab])) OR ((Learning[tiab] AND Machine[tiab])) OR ("Transfer Learning"[Title/Abstract])) OR ((Learning[tiab] AND Transfer[tiab])) OR ("Deep learning"[Title/Abstract])) OR ("Computer-Assisted"[Title/Abstract])) OR ("neural network"[Title/Abstract])) OR (Automated[Title/Abstract])) OR ((Learning[tiab] AND Deep[tiab])) OR ("Hierarchical Learning"[Title/Abstract])) OR ((Learning[tiab] AND Hierarchical[tiab])) AND (((("Thyroid Nodule"[MeSH Terms]) OR ("Thyroid Gland"[MeSH Terms])) OR ("Thyroid Nodule"[Title/Abstract])) OR ("Thyroid Gland"[Title/Abstract])) OR (Thyroid[Title/Abstract])) OR ("thyroid cancer"[Title/Abstract])) OR ("thyroid tumour"[Title/Abstract])) OR ("thyroid neoplasms"[Title/Abstract])) OR ("thyroid carcinoma"[Title/Abstract])) OR ((Nodules[tiab] AND Thyroid[tiab])) OR ((Nodule[tiab] AND Thyroid[tiab])) AND (((("Genetic Marker"[MeSH Terms]) OR ("Single-Cell Gene Expression Analysis"[MeSH Terms])) OR ("Genetic Marker"[Title/Abstract])) OR ("Single-Cell Gene Expression Analysis"[Title/Abstract])) OR ("DNA Marker"[Title/Abstract])) OR ("RNA Marker"[Title/Abstract])) OR ((Marker*[tiab] AND Genetic[tiab])) OR ("Single Cell Gene Expression"[Title/Abstract])) OR ("Biomarker"[Title/Abstract])) OR ("Biological Marker"[Title/Abstract])) OR ((Marker[tiab] AND Biologi*[tiab])) OR ("Molecular Marker"[Title/Abstract])) OR ("Single Cell Transcriptome"[Title/Abstract])) OR ("Single Cell RNA Seq"[Title/Abstract])) OR ((RNA-Seq*[tiab] AND Single-Cell[tiab])) OR ("Sc-RNAseq"[Title/Abstract])) OR ("ScRNAseq"[Title/Abstract])) OR ("ScRNA-seq"[Title/Abstract])) OR ("ScDNA-seq"[Title/Abstract])) OR ("ScDNAseq"[Title/Abstract])) OR ("Sc-DNAseq"[Title/Abstract])) OR ("Single Cell DNA Seq"[Title/Abstract])) OR ((DNA-Seq*[tiab] Single-Cell[tiab]))

Artificial Intelligence Machine Learning	"Thyroid Nodule" "Thyroid Gland"	Thyroid Neoplasms	Neoplasm Staging
Intelligence, Artificial	"Thyroid Nodule"	Neoplasm*, Thyroid	Cancer Staging
Computer Reasoning	"Thyroid Gland"	"Thyroid Neoplasm"	Staging, Cancer
Artificial Intelligence	Thyroid	"Thyroid Carcinoma"	Staging, Neoplasm
Reasoning, Computer	"thyroid cancer"	Carcinoma*, Thyroid	Tumor Staging
Machine Intelligence	"thyroid tumour"	"Thyroid Cancer"	Staging, Tumor
Intelligence, Machine	"thyroid neoplasms"	Cancer*, Thyroid	Staging, TNM
	Nodules, Thyroid Nodule, Thyroid	Thyroid Adenoma*	Classification*, TNM

<p>Computational Intelligence Intelligence, Computational Computer Vision System* System, Computer Vision Systems, Computer Vision Vision System, Computer Vision Systems, Computer Learning, Machine Transfer Learning Learning, Transfer Deep learning Computer-Assisted neural network* Automated Learning, Deep Hierarchical Learning Learning, Hierarchical</p>		<p>Adenoma*, Thyroid “thyroid malignan*” “malignant thyroid” “thyroid tumor*” tumor, thyroid “metastasis”</p>	<p>TNM Classification*</p>
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Pubmed search: 19 (2024:4/2023:6/2022:3/2021:2/ 2020:4)

(((((("Thyroid Neoplasms"[MeSH Terms]) OR ("Thyroid Neoplasm*[Title/Abstract]) OR ((Neoplasm*[tiab] AND Thyroid[tiab])) OR ("Thyroid Carcinoma*[Title/Abstract]) OR ((Carcinoma*[tiab] AND Thyroid[tiab])) OR ("Thyroid Cancer*[Title/Abstract]) OR ((Cancer*[tiab] AND Thyroid[tiab])) OR ("Thyroid Adenoma*[Title/Abstract]) OR ((Adenoma*[tiab] AND Thyroid[tiab])) OR ("thyroid malignan*[Title/Abstract]) OR ("malignant thyroid"[Title/Abstract]) OR ("thyroid tumor*[Title/Abstract]) OR ((tumor[tiab] AND thyroid[tiab])) OR ("metastasis"[Title/Abstract]) AND (((((((((Neoplasm Staging[MeSH Terms]) OR ("Neoplasm Staging"[Title/Abstract]) OR ("Cancer Staging"[Title/Abstract]) OR ((Staging[tiab] AND Cancer[tiab])) OR ((Staging[tiab] AND Neoplasm[tiab])) OR ("Tumor Staging"[Title/Abstract]) OR ((Staging[tiab] AND Tumor[tiab])) OR ("TNM Staging"[Title/Abstract]) OR ((Staging[tiab] AND TNM[tiab])) OR ((Classification[tiab] AND TNM[tiab])) OR ("TNM Classification*[Title/Abstract]) AND (((((((((((((((("Artificial Intelligence"[MeSH Terms]) OR ("Machine Learning"[MeSH Terms])) OR ("Intelligence, Artificial"[Title/Abstract]) OR ("Computer Reasoning"[Title/Abstract]) OR ("Artificial Intelligence"[Title/Abstract]) OR ((Reasoning[tiab] AND Computer[tiab])) OR ("Machine Intelligence"[Title/Abstract]) OR ((Intelligence[tiab] AND Machine[tiab])) OR ("Computational Intelligence"[Title/Abstract]) OR ((Intelligence[tiab] AND Computational[tiab])) OR ("Computer Vision System*[Title/Abstract]) OR ((System[tiab] AND Computer Vision[tiab])) OR ((Systems[tiab] AND Computer Vision[tiab]))) OR ((Vision System[tiab] AND Computer[tiab])) OR ((Vision Systems[tiab] AND Computer[tiab])) OR ((Learning[tiab] AND Machine[tiab])) OR ("Transfer Learning"[Title/Abstract]) OR ((Learning[tiab] AND Transfer[tiab])) OR ("Deep learning"[Title/Abstract]) OR ("Computer-Assisted"[Title/Abstract]) OR ("neural network*[Title/Abstract]) OR (Automated[Title/Abstract]) OR ((Learning[tiab] AND Deep[tiab])) OR ("Hierarchical Learning"[Title/Abstract]) OR ((Learning[tiab] AND Hierarchical[tiab])))) AND (((((((("Thyroid Nodule"[MeSH Terms]) OR ("Thyroid Gland"[MeSH Terms])) OR ("Thyroid Nodule*[Title/Abstract]) OR ("Thyroid Gland"[Title/Abstract]) OR (Thyroid[Title/Abstract]) OR ("thyroid cancer"[Title/Abstract]) OR ("thyroid tumour"[Title/Abstract]) OR ("thyroid neoplasms"[Title/Abstract]) OR ("thyroid carcinoma"[Title/Abstract]) OR ((Nodules[tiab] AND Thyroid[tiab])) OR ((Nodule[tiab] AND Thyroid[tiab]))

Mesh terms	Artificial Intelligence Machine Learning	"Thyroid Nodule" "Thyroid Gland"	Surgical Procedures, Operative Therapeutics
text words	Intelligence, Artificial Computer Reasoning Artificial Intelligence Reasoning, Computer Machine Intelligence	"Thyroid Nodule*" "Thyroid Gland" Thyroid "thyroid cancer" "thyroid tumour" "thyroid neoplasms" "thyroid carcinoma"	Surgical Procedure* Procedure*, Surgical Operative Procedure* Procedures, Operative Intraoperative Postoperative

	<p>Intelligence, Machine Computational Intelligence Intelligence, Computational Computer Vision System* System, Computer Vision Systems, Computer Vision Vision System, Computer Vision Systems, Computer Learning, Machine Transfer Learning Learning, Transfer Deep learning Computer-Assisted neural network* Automated Learning, Deep Hierarchical Learning Learning, Hierarchical</p>	<p>Nodules, Thyroid Nodule, Thyroid</p>	<p>Surgery radioactive iodine therapy RAIT Therapeutic* Therap* Treatment*</p>
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Pubmed search: 499 (2024:109/2023:148/2022:99/2021:89/ 2020:54)

((((((((((((((((((((((("Artificial Intelligence"[MeSH Terms]) OR ("Machine Learning"[MeSH Terms]))) OR ("Intelligence, Artificial"[Title/Abstract])) OR ("Computer Reasoning"[Title/Abstract])) OR ("Artificial Intelligence"[Title/Abstract])) OR ((Reasoning[tiab] AND Computer[tiab]))) OR ("Machine Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Machine[tiab]))) OR ("Computational Intelligence"[Title/Abstract])) OR ((Intelligence[tiab] AND Computational[tiab]))) OR ("Computer Vision System*"[Title/Abstract])) OR ((System[tiab] AND Computer Vision[tiab]))) OR ((Systems[tiab] AND Computer Vision[tiab]))) OR ((Vision System[tiab] AND Computer[tiab])) OR ((Vision Systems[tiab] AND Computer[tiab])) OR ((Learning[tiab] AND Machine[tiab])) OR ("Transfer Learning"[Title/Abstract])) OR ((Learning[tiab] AND Transfer[tiab])) OR ("Deep learning"[Title/Abstract])) OR ("Computer-Assisted"[Title/Abstract])) OR ("neural network*"[Title/Abstract])) OR (Automated[Title/Abstract])) OR ((Learning[tiab] AND Deep[tiab])) OR ("Hierarchical Learning"[Title/Abstract])) OR ((Learning[tiab] AND Hierarchical[tiab])) AND (((((((((((("Thyroid Nodule"[MeSH Terms]) OR ("Thyroid Gland"[MeSH Terms])) OR ("Thyroid Nodule*"[Title/Abstract])) OR ("Thyroid Gland"[Title/Abstract])) OR (Thyroid[Title/Abstract])) OR ("thyroid cancer"[Title/Abstract])) OR ("thyroid tumour"[Title/Abstract])) OR ("thyroid neoplasms"[Title/Abstract])) OR ("thyroid carcinoma"[Title/Abstract])) OR ((Nodules[tiab] AND Thyroid[tiab])) OR ((Nodule[tiab] AND Thyroid[tiab]))) AND (((((((((((("Surgical Procedures, Operative"[MeSH Terms]) OR (Therapeutics[MeSH Terms])) OR ("Therapeutic*"[Title/Abstract])) OR ("Surgical Procedure*"[Title/Abstract])) OR ((Procedure*[tiab] AND Surgical[tiab])) OR ("Operative Procedure*"[Title/Abstract])) OR ((Procedures[tiab] AND Operative[tiab])) OR ("Intraoperat*"[Title/Abstract])) OR ("Postoperat*"[Title/Abstract])) OR ("Surgery"[Title/Abstract])) OR ("radioactive iodine therapy"[Title/Abstract])) OR ("RAIT"[Title/Abstract])) OR ("Therapeutic*"[Title/Abstract])) OR ("Therap*"[Title/Abstract])) OR ("Treatment*"[Title/Abstract]))