

SEARCH HISTORY

Application Number	PCT/US 19/55435
Search Conducted By	ABP
Search Approved By	RII

CPC/IPC Classifications Searched	IPC: G01S 15/88; G01S 15/89 (2020.01) CPC: G01S 15/88; G01S 15/89; G01S15/66; G01S 15/87; G01S15/96
Date Conducted	26 May 2020 (26.05.2020)

Documentation Searched	IPC: G01S 15/88; G01S 15/89 (2020.01) CPC: G01S 15/88; G01S 15/89; G01S15/66; G01S 15/87; G01S15/96
Search Terms Used	sonar, underwater, subsurface, ship, boat, vessel, below, convolutional, neural, network, invariant, artificial, SIANN, ConvNet, learning, algorithm, detect, determine, measure, identify, monitor, calculate, classify, floor, seafloor, bed, seabed, backscatter, 3D, dimensional, forward, training, marine, maritime
Date Conducted	26 May 2020 (26.05.2020)

Electronic Database Searched	PatBase
Files Searched	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
Date Conducted	26 May 2020 (26.05.2020)

Search Logic:

Search 1: CPC=(G01S15/88 or G01S15/89 or G01S15/66 or G01S15/87 or G01S15/96) (Results 4270)
 Search 2: IC=(G01S15/88 or G01S15/89) (Results 10443)
 Search 3: 1 or 2 (Results 12320)
 Search 4: 2 and FT=(sonar# w8 (underwater% or subsurface% or ship or ships or boat% or vessel% or under water or below water)) (Results 740)
 Search 5: 4 and Ft=((convolutional neural network) or (invariant artificial neural network%) or SIANN or convnet) (Results 2)
 Search 6: 4 and FT=((neural* network*) or (learning* algorithm*)) (Results 14)
 Search 7: 2 and FT=(sonar# w12 (underwater% or subsurface% or ship or ships or boat% or vessel% or "under water" or "below water" or marine or maritime%)) (Results 885)
 Search 8: 7 and FT=(learn* w4 (software% or program% or algorithm%)) (Results 3)
 Search 9: 7 and FT=((detect* or determin* or measur* or identif* or monitor* or calculat*) near (Classif* or floor% or seafloor% or bed% or seabed%)) (Results 174)
 Search 10: 9 and FT=(backscatter*) (Results 33)
 Search 11: 9 and FT=(3d or "3-D" or ("3" or three) w2 dimensional*) (Results 79)
 Search 12: FT=(sonar# w12 (underwater% or subsurface% or ship or ships or boat% or vessel% or "under water" or "below water" or marine or maritime%)) (Results 5925)
 Search 13: SP=(sonar# and (underwater% or subsurface% or ship or ships or boat% or vessel% or "under water" or "below water" or marine or maritime%)) (Results 8873)
 Search 14: 13 and Ft=((convolutional neural network) or (invariant artificial neural network%) or SIANN or convnet) (Results 167)
 Search 15: 13 and FT=((neural* network*) or (learning* algorithm*)) (Results 359)
 Search 16: 15 and FT=((detect* or determin* or measur* or identif* or monitor* or calculat*) near (Classif* or floor% or seafloor% or bed% or seabed%)) (Results 242)
 Search 17: 16 and FT=(3d or "3-D" or ("3" or three) w2 dimensional*) (Results 196)
 Search 18: 17 and FT=(backscatter*) (Results 6)
 Search 19: 13 and FT=(learn* w4 (software% or program% or algorithm%)) (Results 223)
 Search 20: 19 and FT=(backscatter*) (Results 6)

Electronic Database Searched	Google Patents
Files Searched	US Patents/Published Applications EPO publications International - China - Germany - Canada
Date Conducted	26 May 2020 (26.05.2020)

Search Logic:

About 16,900 results (0.41 seconds)
three dimensional forward facing sonar system

About 3,040 results (0.45 seconds)
three dimensional forward facing sonar system with training neural network

About 3,040 results (0.63 seconds)
three dimensional forward facing sonar system with training neural network using different times

About 10,200 results (0.44 seconds)
("three dimensional" OR "3D") sonar (ship OR ocean OR vessel OR maritime)

About 4,430 results (0.37 seconds)
("three dimensional" OR "3D") sonar (ship OR ocean OR vessel OR maritime) ("neural network" OR "learning algorithm")

About 1,510 results (0.71 seconds)
("three dimensional" OR "3D") sonar (ship OR ocean OR vessel OR maritime) ("neural network" OR "learning algorithm") ("different time" OR "different times" OR "different angle" OR "different angles")

Electronic Database Searched	Google Scholar
Files Searched	Articles excluding patents published anytime including at least summaries.
Date Conducted	26 May 2020 (26.05.2020)

Search Logic:

About 26,000 results (0.11 sec)
three dimensional forward facing sonar system

About 13,800 results (0.48 sec)
three dimensional forward facing sonar system with training neural network

About 13,700 results (0.16 sec)
three dimensional forward facing sonar system with training neural network using different times

About 49,500 results (0.08 sec)
("three dimensional" OR "3D") sonar (ship OR ocean OR vessel OR maritime)

About 14,000 results (0.11 sec)
("three dimensional" OR "3D") sonar (ship OR ocean OR vessel OR maritime) ("neural network" OR "learning algorithm")

About 2,450 results (0.11 sec)
("three dimensional" OR "3D") sonar (ship OR ocean OR vessel OR maritime) ("neural network" OR "learning algorithm") ("different time" OR "different times" OR "different angle" OR "different angles")

angles")

About 666 results (0.07 sec)

"convolutional neural network" sonar ship