serial	Cite	SAR NN link
1.	Kulich, Miroslav, et al. "Rescue operation planning by soft computing techniques." *IEEE 4th International Conference on Intelligent Systems Design and Application*. Vol. 1. 2004.	In conclusion section it is mentioned that **NN techniques are used in obstacles considering** during run.
2	Driewer, Frauke, et al. "Hybrid telematic teams for search and rescue operations." *IEEE International Workshop on Safety, Security, and Rescue Robotics, SSRR 2004*. 2004.	While ensuring that every point is in working environment is visited at least once. They solved **Multiple traveling sales man problem using self organizing neural networks techniques** for SAR operations.
3	Bahadori, Shahram, et al. "Autonomous systems for search and rescue." *A Birk, S. Carpin, D. Nardi, Jacoff A., and S. Tadokoro, eds. Rescue Robotics. Springer-Verlag* (2005).	Probabilistic Roadmap (PRM) uses graph representation of roadmap. T**his picks random positions and combine them so in SAR** it expects the input map that does not change over time. GNG is a NN which is combine with PRM to reduce the dimensionality of input space.
4	Reinaldo, Francisco, et al. "Applying biological paradigms to emerge behaviour in robocup rescue team." *Portuguese Conference on Artificial Intelligence*. Springer, Berlin, Heidelberg, 2005.	Artificial Neural Networks are used in order to make a**gents capable of learning information from the environment.** This allows agents to improve several algorithms like their **Path Finding Algorithm to find the shortest path** between two points. Under disaster rescuing different cities.
5	Gazit, Irit, et al. "A simple system for the remote detection and analysis of sniffing in explosives detection dogs." *Behavior Research Methods, Instruments, & Computers* 35.1 (2003): 82-89.	Feed forward **NN used for discrimination of dog snipping** (in searching explosive).
6	Braganza, D., et al. "Neural network grasping controller for continuum robots." *Proceedings of the 45th IEEE Conference on Decision and Control*. IEEE, 2006.	Grasping controller in which **NN is used to compensate dynamic uncertainty** such capabilities of grasping are used in search and rescue operations
7	H. Leung, N. Dubash and N. Xie, "Detection of small objects in clutter using a GA-RBF neural network," in *IEEE Transactions on Aerospace and Electronic Systems*, vol. 38, no. 1, pp. 98-118, Jan. 2002. doi: 10.1109/7.993232	Neural networks used an**d applicable for real life search and navigations.**
8	H. Kim, D. Kim, Sungwook Jung, Jungmo Koo, J. Shin and H. Myung, "Development of a UAV-type jellyfish monitoring system using deep learning," *2015 12th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI)*, Goyang, 2015, pp. 495-497.	Jelly fishes sting is very dangerous so for detection of **jelly fish deep learning techniques(CNN) are used.**

	doi: 10.1109/URAI.2015.7358813	
9	M. Bejiga, A. Zeggada, A. Nouffidj, and F. Melgani, "A convolutional neural network approach for assisting avalanche search and rescue operations with UAV imagery," Remote Sensing, vol. 9, no. 2, p. 100, 2017.	Finding of **avalanche attack using NN techniques** on images.
10	A. Sawarkar, V. Chaudhari, R. Chavan, V. Zope, A. Budale, and F. Kazi, "HMD vision-based teleoperating UGV and UAV for hostile environment using deep learning," CoRR abs/1609.04147. URL http://arxiv.org/abs/1609.04147.	**Terrorist identification** using deep learning (cnn)
11	R. Girshick, J. Donahue, T. Darrell, and J. Malik, "Rich feature hierarchies for accurate object detection and semantic segmentation," in Proceedings of the 27th IEEE Conference on Computer Vision and Pattern Recognition (CVPR '14), pp. 580– 587, Columbus, Ohio, USA, June 2014	CNN used in **object detection for SAR possible**.
12	Delmerico, Jeffrey, et al. "Active autonomous aerial exploration for ground robot path planning." *IEEE Robotics and Automation Letters* 2.2 (2017): 664-671.	In search and rescue **small time** is required so they used **CNN for short path finding**
13	J. Delmerico, A. Giusti, E. Mueggler, L. M. Gambardella, and D. Scaramuzza, ""on-the-spot training" for terrain classification in autonomous air-ground collaborative teams," in Proceedings of the International Symposium on Experimental Robotics (ISER), EPFL-CONF-221506, 2016.	In search and rescue **time is critical so fast working CNN**.
14	Pang, Tao, et al. "Based on A* and q-learning search and rescue robot navigation." *Telkomnika Indonesian Journal of Electrical Engineering* 10.7 (2012): 1889-1896.	Neural networks are used for searching and rescuing operations
15	Visser, Arnoud, et al. "Amsterdam Oxford Joint Rescue Forces-Team Description Paper-Virtual Robot competition-Rescue Simulation League-RoboCup 2008." *Proceedings CD of the 12th RoboCup Symposium*. 2008.	In a roboCup competition this techniques used for rescue purposes
16	Calisi, D., et al. "Autonomous exploration for search and rescue robots." *WIT Transactions on the Built Environment* 94 (2007).	**GNG(growing neural gas)** used which is unsupervised neural network

17	Sharma, Vishal, and Rajesh Kumar. "A cooperative network framework for multi-UAV guided ground ad hoc networks." *Journal of Intelligent & Robotic Systems* 77.3-4 (2015): 629-652.	The network framework proposed in the paper uses **neural network to form cognitive and topology maps**.
18	Ni, Jianjun, and Simon X. Yang. "Bioinspired neural network for real-time cooperative hunting by multirobots in unknown environments." *IEEE Transactions on Neural Networks* 22.12 (2011): 2062-2077.	In this paper, a novel approach based on a **bioinspired neural network is proposed for the real-time cooperative hunting by multirobots**, where the locations of evaders and the environment are unknown and changing
19	T. Latif, E. Whitmire, T. Novak and A. Bozkurt, "Sound Localization Sensors for Search and Rescue Biobots," in *IEEE Sensors Journal*, vol. 16, no. 10, pp. 3444-3453, May15, 2016. doi: 10.1109/JSEN.2015.2477443	For **search and rescue sound localization techniques** are used with help of neural engineering.
20	Nagabandi, Anusha, et al. "Neural network dynamics for model-based deep reinforcement learning with model-free fine-tuning." *2018 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE, 2018.	This **technique is used in small robots** which are used for research and rescue as well.
21	Bejiga, Mesay Belete, Abdallah Zeggada, and Farid Melgani. "Convolutional neural networks for near real-time object detection from uav imagery in avalanche search and rescue operations." *2016 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. IEEE, 2016.	Used in **Unmanned autonomous vehicle for avalanche research and rescue operations.**
22	Braganza, David, et al. "A neural network controller for continuum robots." *IEEE transactions on robotics* 23.6 (2007): 1270-1277.	Also NN used for search and rescue operations.
23	Garg, Ravi, et al. "Unsupervised cnn for single view depth estimation: Geometry to the rescue." *European Conference on Computer Vision*. Springer, Cham, 2016.	Also used for search and rescue
24	Kurban, Tuba, and Erkan Beşdok. "A comparison of RBF neural network training algorithms for inertial sensor based terrain classification." *Sensors* 9.8 (2009): 6312-6329.	search/rescue missions are some fields.
25	Nawrocki, Robert A., et al. "Towards an all-polymer robot for search and rescue." *2009 IEEE*	This paper discusses two components suitable for construction of an all-**polymer**

	International Workshop on Safety, Security & Rescue Robotics (SSRR 2009). IEEE, 2009.	**robot, namely a Synthetic Neural Network** and water hammer based actuation
26	Jain, Pooja, and M. C. Deo. "Neural networks in ocean engineering." *Ships and offshore structures* 1.1 (2006): 25-35.	This paper takes a stock of the research studies reported so far in these areas. It is found that, in **general, neural networks provide a better alternative**
27	Perlovsky, Leonid I., et al. "Model-based neural network for target detection in SAR images." *IEEE Transactions on image processing* 6.1 (1997): 203-216.	we introduce a concept of a model-based neural network, whose adaptive learning is based on a priori models. **Applications to target detection in SAR images are discussed**
28	Inoue, Kousuke, Shugen Ma, and Chenghua Jin. "Neural oscillator network-based controller for meandering locomotion of snake-like robots." *IEEE International Conference on Robotics and Automation, 2004. Proceedings. ICRA'04. 2004*. Vol. 5. IEEE, 2004.	This paper presents a **mission decision-making model based on Bayesian Network** for rescue problems in the complex marine environment
29	Calise, Anthony J., and Rolf T. Rysdyk. "Nonlinear adaptive flight control using neural networks." *IEEE Control Systems Magazine* 18.6 (1998): 14-25.	Feedback linearization and adaptive **neural networks provide a powerful controller architecture.**
30	Awad, Fahed, and Rufaida Shamroukh. "Human Detection by Robotic Urban Search and Rescue Using Image Processing and Neural Networks." *International Journal of Intelligence Science* 4.02 (2014): 39.	This paper proposes a new approach for **detecting human survivors in destructed environment**s using an autonomous robot. The images are fed into a feed-forward neural network, trained to detect the existence of a human body or part of it within an obstructed environment
31	Inggs, M. R., and A. D. Robinson. "Ship target recognition using low resolution radar and neural networks." *IEEE Transactions on Aerospace and Electronic Systems* 35.2 (1999): 386-393.	The classification of ship targets using **low resolution down-range radar profiles together with preprocessing and neural networks is investigated**
32	Gerdzhev, Martin, et al. "A scrubbing technique for the automatic detection of victims in urban search and rescue video." *Proceedings of the 6th International Wireless Communications and Mobile Computing Conference*. ACM, 2010.	We have been exploring ways to **speed the process of video** —scrubbing‖ by automatically **discarding segments of video which show nothing interesting** and concentrating on segments that are critical
33	Sampedro, Carlos, et al. "A fully-autonomous aerial robot for search and rescue applications in indoor environments using learning-based techniques." *Journal of Intelligent & Robotic Systems* (2018): 1-27.	Convolutional Neural Network (CNN) model trained for target/background classification. Search and Rescue (SAR) missions represent an

		important challenge in the robotics research field
34	Flynn, Helen. *Machine learning applied to object recognition in robot search and rescue systems*. Diss. University of Oxford, 2009.	Neural networks are used for object recognition.
35	Rowley, H. A., Baluja, S., and Kanade, T. Neural network-based face detection. IEEE Transactions On Pattern Analysis and Machine intelligence 20 (1998), 23–38.	Rowley et al. proposed an advanced neural network approach for detecting faces, which employed multiple neural networks to classify different facial features, and used a voting system to decide if an entire face
36	] Lecun, Y., Bottou, L., Bengio, Y., and Haffner, P. Gradient-based learning applied to document recognition. Proceedings of the IEEE 86, 11 (Nov 1998), 2278 – 2324.	three architectural ideas to a convolutional neural network
37	Wang, Yunpeng, et al. "Optimal formation of multirobot systems based on a recurrent neural network." *IEEE transactions on neural networks and learning systems* 27.2 (2016): 322-333.	the recurrent neural network based approach can solve the large-scale optimal formation problems more effectively due to its parallel computation nature
38	Dierks, Travis, and Sarangapani Jagannathan. "Neural network control of mobile robot formations using RISE feedback." *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)* 39.2 (2009): 332-347.	NN tracking controller for leader–follower-based formation control was presented that considers the dynamics of the leader and the followers using backstepping with RISE feedback
39	He, Wei, et al. "Adaptive neural network control of a flapping wing micro aerial vehicle with disturbance observer." *IEEE transactions on cybernetics* 47.10 (2017): 3452-3465.	In the military applications, law enforcement and the rescue operations are the applications where a data network is required. To develop an accurate process model using Artificial Neural Network (ANN), the learning process or training and validation are among the important steps.
40	He, Wei, et al. "Adaptive neural network control of a flapping wing micro aerial vehicle with disturbance observer." *IEEE transactions on cybernetics* 47.10 (2017): 3452-3465.	Adaptable Neural network in micro aerial vehicle for search and rescue.
41	Dierks, Travis, and S. Jagannathan. "Neural network control of quadrotor UAV formations." *2009 American Control Conference*. IEEE, 2009.	A new framework for quadrotor UAV leader-follower formation control was presented along with a novel NN formation control law which allows each follower to track its leader without the knowledge of dynamics.
42	Chao, HaiYang, YongCan Cao, and YangQuan Chen. "**Autopilots for small unmanned aerial vehicles: a survey**." *International Journal of Control, Automation and Systems* 8.1 (2010): 36-44.	This is survey paper which is very helpful in search and rescue using neural network techniques are discussed.

43	Dierks, Travis, and Sarangapani Jagannathan. "Neural network output feedback control of a quadrotor UAV." *2008 47th IEEE Conference on Decision and Control*. IEEE, 2008.	—A neural network (NN) based output feedback controller for a quadrotor unmanned aerial vehicle (UAV) is proposed. This can be used for search and rescue as well.
44	Lilienthal, Achim, et al. "Gas source declaration with a mobile robot." *IEEE International Conference on Robotics and Automation, 2004. Proceedings. ICRA'04. 2004*. Vol. 2. IEEE, 2004.	Gas source Declaration. One way to solve non-linear classification problems is provided by artificial neural networks.
45	Kia, Masoud Bakhtyari, et al. "An artificial neural network model for flood simulation using GIS: Johor River Basin, Malaysia." *Environmental Earth Sciences* 67.1 (2012): 251-264.	It is neural network model for flood simulations using geographic information system which is used for search and rescue as well.
46	Melinte, Octavian, et al. "Haptic interfaces for compensating dynamics of rescue walking robots." *Procedia Computer Science* 65 (2015): 218-224.	This paper presents a Neural Network approach to compensate dynamic terms, friction force in particular, of a rescue walking robot used in haptic interfaces.
47	Johnson, Eric, and Suresh Kannan. "Adaptive flight control for an autonomous unmanned helicopter." *AIAA Guidance, Navigation, and Control Conference and Exhibit*. 2002.	Neural Network based adaptive flight control may be applied to control a helicopter which can use for search and rescue
48	Bhardwaj, Arpit, and Aruna Tiwari. "Breast cancer diagnosis using genetically optimized neural network model." *Expert Systems with Applications* 42.10 (2015): 4611-4620.	Genetically Optimized Neural Network (GONN) algorithm, for solving classification problems. We evolve a neural network genetically to optimize its architecture (structure and weight) for classification.
49	Miljković, Zoran, et al. "Neural network reinforcement learning for visual control of robot manipulators." *Expert Systems with Applications* 40.5 (2013): 1721-1736.	problems in visual servo control of robots are related to the performance analysis of the system. In this paper, the development and performance evaluation of a novel intelligent visual servo controller for a robot manipulator using neural network Reinforcement Learning is presented
50	Yang, Simon X., and Chaomin Luo. "A neural network approach to complete coverage path planning." *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)* 34.1 (2004): 718-724.	It is a neural network approach for path planning.
51	Madani, Tarek, and Abdelaziz Benallegue. "Adaptive control via backstepping technique and	A nonlinear adaptive controller for the quadrotor helicopter is proposed using

	neural networks of a quadrotor helicopter." *IFAC Proceedings Volumes* 41.2 (2008): 6513-6518.	backstepping technique mixed with neural networks which is also used for search and rescue.
52	Smolyanskiy, Nikolai, et al. "Toward low-flying autonomous MAV trail navigation using deep neural networks for environmental awareness." *2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2017.	search-and-rescue, environmental mapping possible using deep neural network
53	Giusti, Alessandro, et al. "A machine learning approach to visual perception of forest trails for mobile robots." *IEEE Robotics and Automation Letters* 1.2 (2016): 661-667.	we propose a different approach based on a Deep Neural Network used as a supervised image classifier. This technique can be used as neural network.