Year	Title	Doi	First Author	Affiliation			Platform		Application						Type of ML	Method	Architecture	Type of training data	Type of data applied to:	Synthetic Model	Input Data	Loss Function
				Academia	Company	Research center		Journal/Conference/Workshop	Application 1	Application 1 note	Application 2	Application 2 note	Application 3	Application 3 note					Synthetic/Real			
2018	Integrating seismic first-break picking methods with a machine learning approach	https://doi.org/10.1190/segam2018-2998293.1	Duan	X			SEG	SEG Technical Program	QC	First break Erroneous pick detection					Supervised	CNN		REal	Real		Raw, surface wave, FB, pre-stack and poststack migrated, velocity model	
2019	3D seismic geometry quality control and corrections by applying machine learning	https://doi.org/10.1190/geo2018-0617.1	Jiang	X	X		SEG	Geophysics	QC	Geometry error (source-receiver)					Supervised	CNN		Synthetic	Both		Raw seismic Data (Zero-offset)	Log loss
2020	Application of a convolutional neural network to classification of swell noise attenuation	https://doi.org/10.1190/segam2020-3425046.1	Farmani		X		SEG	SEG Technical Program	QC	Noise Recognition (Swell Noise)					Supervised	CNN	U-Net	Real	Real		Raw seismic Data (Amplitude)	
2021	Framework and standalone applications of machine learning in seismic processing	https://doi.org/10.1190/segam2021-3580418.1	Martin		X		SEG	International Meeting for Applied Geoscience & Energy	QC	Noise recognition	Denoising	Multiple (Linear, Multiples, Groundroll)			Supervised	CNN	U-NET	Real	Real		Post-stack migrated	
2021	Automatic Spiky Trace Removal Using Artificial Neural Network	https://doi.org/10.3997/2214-4609.202132017	Vishwakarma		X		EAGE	EAGE Annual	QC	Anomalous Trace detection					Supervised	ANN						
2020	Improving quality control and data understanding of a large OBN survey through unsupervised machine learning	https://doi.org/10.3997/2214-4609.2020611028	Damianus		X		EAGE	EAGE Annual	QC	First break Erroneous pick detection					Unsupervised	multiple(Kmeans/PCA)		Real	Real			
2020	Visual Identification of Noisy Seismic Records with Machine Learning	https://doi.org/10.3997/2214-4609.202011503	Walpole		X		EAGE	EAGE Annual	QC	Noise recognition					Supervised	CNN						
2020	Application of Convolutional Neural Network in Automated Swell Noise Attenuation	https://doi.org/10.3997/2214-4609.202010329	Farmani		X		EAGE	EAGE Annual	QC	Noise recognition					Supervised	CNN	U-NET	Real	Real		Raw seismic Data (Amplitude)	
2019	Application of unsupervised machine learning to the processing of a land mega-survey	https://doi.org/10.3997/2214-4609.2019X6104	Hou		X		EAGE	Subsurface intelligence workshop	QC	Anomalous Trace detection	Anisotropy				Unsupervised	Multiple(Kmeans/PCA)		Real	Real		Raw seismic Data (Amplitude)	
2019	Leveraging a Supervised Machine Learning Toolkit For Better Seismic Processing Quality Control	https://doi.org/10.3997/2214-4609.201901618	Chambefort	X	X		EAGE	EAGE Annual	QC	Multiple (cycle skipping potential, rig noise, data reduction)					Supervised	KNN		Real	Real		Raw seismic Data (Amplitude)	
2019	Automatic QC of denoise processing using a machine learning classification	https://doi.org/10.3997/1365-2397.n0055	Bekara				EAGE	First Break	QC	Anomalous Trace detection												
2018	Random noise attenuation method for seismic data based on deep residual networks	https://doi.org/10.1190/IGC2018-435	Zhang	X	X		SEG	International Geophysical Conference, Beijing, China	Denoising	Random					Supervised	Residual NN		real	Real		Migrated	
2018	Deep learning for denoising	https://doi.org/10.1190/IGC2018-113	Yu	X			SEG	INTERNATIONAL GEOPHYSICAL CONFERENCE	Denoising	multiple (random, linear, multiples)					Supervised	CNN		Synthetic	Both		Raw/post-stack	
2018	Separating ground-roll from land seismic record via convolutional neural network	https://doi.org/10.1190/AIML2018-16.1	Jia	X	X		SEG	SEG Maximizing Asset Value Through Artificial Intelligence and Machine Learning, Beijing, China	Denoising	Groundroll					Supervised	CNN		Synthetic	Both		Raw seismic Data (Amplitude)	
2019	Ground-roll noise attenuation based on convolutional neural network	https://doi.org/10.1190/frur2019_18.1	Li		X		SEG	Workshop: Fractured Reservoir & Unconventional Resources Forum: Prospects and Challenges in the Era of Big Data, Lanzhou, China,	Denoising	Groundroll					Supervised	Residual NN		Both	Both		Raw seismic Data (Amplitude)	
2018	Generative-adversarial network-based fast-noise removal on land-seismic data	https://doi.org/10.1190/segam2018-2995310.1	Xie		X		SEG	SEG Technical Program	Denoising	Random					Semi-supervised	GAN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	
2018	Automated ambient-noise processing applied to fiber-optic seismic acquisition (DAS)	https://doi.org/10.1190/segam2018-2997880.1	Huot	X			SEG	SEG Technical Program	Denoising	Random (DAS)					Supervise/Unsupervised	Multiple (CNN/SOM)		Real	Real		Raw seismic Data (Amplitude)	
2018	Noise attenuation for seismic image using a deep-residual learning	https://doi.org/10.1190/segam2018-2997974.1	Zhang	X			SEG	SEG Technical Program	Denoising	Random					Supervised	CNN		Synthetic	Both		Raw seismic Data (Amplitude)	MSE
2018	Random-noise suppression in seismic data: What can deep learning do?	https://doi.org/10.1190/segam2018-2998114.1	Liu	X			SEG	SEG Technical Program	Denoising	Random					Supervised	DnCNN						
2019	Seismic random noise attenuation in F-x domain using complex-valued residual convolutional neural network	https://doi.org/10.1190/segam2019-3216543.1	Kim	X			SEG	SEG Technical Program	Denoising	Random					Supervised	CNN	ComplexNet	Synthetic	Synthetic		F-X	
2018	Seismic data denoising by deep-residual networks	https://doi.org/10.1190/segam2018-2998619.1	Jin	X	X		SEG	SEG Technical Program	Denoising	Random					Supervised	DRN (deep residual network)		Real	Real		Raw seismic Data (Amplitude)	MSE
2018	Deep learning for ground-roll noise attenuation	https://doi.org/10.1190/segam2018-2981295.1	Li		X		SEG	SEG Technical Program	Denoising	Groundroll					Supervised	CNN	dnCNN	Real	Real		Raw seismic Data (Amplitude)	MSE
2019	Learning seismic image enhancement from pairs of 3D partial and full image volumes	https://doi.org/10.1190/segam2019-3200259.1	Wang		X		SEG	SEG Technical Program	Denoising	Enhanced stacking					Supervised	CNN	U-Net	Synthetic	Synthetic	SEAM	Pre-stack migrated	
2019	Swell-noise attenuation: A deep learning approach	https://doi.org/10.1190/tle38120934.1	Zhao	X	X		SEG	TLE	Denoising	Swell					Supervised	CNN	Only2Noise	Synthetic	Both		Raw seismic Data (Amplitude)	MSE
2019	Applying machine learning to 3D seismic image denoising and enhancement	https://doi.org/10.1190/INT-2018-0224.1	Wang		X		SEG	Interpretation	Denoising	multiple (random, coherent, migration)					Supervised	CNN	U-net	Real	Synthetic		Post-stack migrated	
2019	White noise attenuation of seismic trace by integrating variational mode decomposition with convolutional neural network	https://doi.org/10.1190/geo2018-0635.1	Wu	X	X		SEG	Geophysics	Denoising	Random					Supervised	CNN		Real	Real		Post-stack migrated	
2020	Ground-roll attenuation using generative adversarial networks	https://doi.org/10.1190/geo2019-0414.1	Yuan	X			SEG	Geophysics	Denoising	Groundroll					Supervised	GAN		Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Deep denoising autoencoder for seismic random noise attenuation	https://doi.org/10.1190/geo2019-0468.1	M. Saad	X			SEG	Geophysics	Denoising	Random					Unsupervised	Denoising auto-encoder (DAE)		Synthetic	Both		Post-stack migrated	
2020	Ground roll attenuation based on conditional and cycle generative adversarial networks	https://doi.org/10.1190/iwmg2019_23.1	Si	X			SEG	SEG 2019 Workshop: Mathematical Geophysics: Traditional vs Learning, Beijing	Denoising	Groundroll					Supervised	cGAN		Both	Both		Raw seismic Data (Amplitude)	
2020	Must we have labels for denoising seismic data based on deep learning?	https://doi.org/10.1190/iwmg2019_08.1	Liu	X	X		SEG	SEG Technical Program	Denoising	Random					Unsupervised	Auto-encoder	U-net	Real	Real		Pre-stack migrated	MSE
2020	Separating primaries and multiples using hyperbolic Radon transform with deep learning	https://doi.org/10.1190/segam2020-3419762.1	Kaur	X			SEG	SEG Technical Program	Denoising	Multiple reflection					Semi-supervised	GAN					Raw seismic Data (Amplitude)	
2020	Deep learning for simultaneous seismic image super-resolution and denoising	https://doi.org/10.1190/segam2020-3426412.1	Li	X			SEG	SEG Technical Program	Denoising	Random					Supervised	CNN	U-net	Synthetic	Both		Post-stack migrated	multiple (L1+MS-SSIM)
2020	Ground roll attenuation with an unsupervised deep learning approach	https://doi.org/10.1190/segam2020-3425792.1	Guo	X	X		SEG	SEG Technical Program	Denoising	Groundroll					Unsupervised	Auto-encoder		Real	Real		Raw seismic Data (Amplitude)	
2021	Physics-guided self-supervised learning for monochromatic noise removal	https://doi.org/10.1190/segam2021-3583068.1	Zi	X			SEG	International Meeting for Applied Geoscience & Energy	Denoising	Linear						CNN	multiple (U-NET, ResNet)	Synthetic	Synthetic	BP 2004	Raw seismic Data (Amplitude)	MSE
2021	Deep learning-based seismic surface-related multiple adaptive subtraction with synthetic primary labels	https://doi.org/10.1190/segam2021-3584041.1	Zhang	X			SEG	International Meeting for Applied Geoscience & Energy	Denoising	Multiple reflection					Supervised	CNN	U-NET	Synthetic	Both		Raw seismic Data (Amplitude)	
2021	Complete and representative training of neural networks: A generalization study using double noise injection and natural images	https://doi.org/10.1190/geo2020-0193.1	Zhang	X			SEG	Geophysics	Denoising	Random					Supervised	CNN	U-NET	Synthetic	Both		Raw seismic Data (Amplitude)	MSE
2021	An innovative strategy for seismic swell noise removal using deep neural networks	https://doi.org/10.1190/segam2021-3592770.1	Brusova				SEG	International Meeting for Applied Geoscience & Energy	Denoising	Seismic interference (Marine)					Supervised	CNN	U-NET				Raw seismic Data (Amplitude)	
2021	Seismic noise attenuation by applying a deep learning method without noise-free labels	https://doi.org/10.1190/segam2021-3583901.1	Wang	X			SEG	International Meeting for Applied Geoscience & Energy	Denoising	Random					Supervised	CNN		Both	Both		Raw seismic Data (Amplitude)	MSE
2021	Physics-constrained deep learning for ground-roll attenuation	https://doi.org/10.1190/segam2021-3583447.1	Pham		X		SEG	International Meeting for Applied Geoscience & Energy	Denoising	Groundroll					Supervised/Unsupervised	CNN						Log loss
2021	Seismic noise attenuation by signal reconstruction: an unsupervised machine learning approach	https://doi.org/10.1111/1365-2478.13070	Gao	X	X		EAGE	Geophysical Prospecting	Denoising	Random					Unsupervised	Not specified						

2021	Adaptive subtraction using a convolutional neural network	https://doi.org/10.3997/1365-2397.fb2021066	Kumar		X	EAGE	First Break	Denoising	Multiple reflection				Supervised	CNN	U-NET	Both	Real	Sigsbee	Raw seismic Data (Amplitude)	multipille (L1 norm, L2 norm)
2020	Machine Learning Enabled Wiener Filters for Attenuating Random Noises in DAS Seismic	https://doi.org/10.3997/2214-4609.202010721	Zhang		X	EAGE	EAGE Annual	Denoising	Random (DAS)				Supervised	CNN						MSE
2020	Seismic Random Noise Attenuation via Unsupervised Sparse Machine Learning	https://doi.org/10.3997/2214-4609.202010042	Gao	X	X	EAGE	EAGE Annual	Denoising	Random				Unsupervised			Real	Real		Post-stack migrated	
2020	Random Noise Attenuation for Desert Seismic Data Using the Complex Diffusion Coupled with Deep Learning	https://doi.org/10.3997/2214-4609.202011198	Zhang	X		EAGE	EAGE Annual	Denoising	Random				Supervised	CNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	
2020	Seismic ground-roll noise attenuation using deep learning	https://doi.org/10.1111/1365-2478.12985	Kaur	X		EAGE	Geophysical Prospecting	Denoising	Groundroll										Raw seismic Data (Amplitude)	multiple (Adversial, cyclic, self distance, identity)
2020	Deep Learning for Migration Artifacts Attenuation	https://doi.org/10.3997/2214-4609.202011932	Klochikhina		X	EAGE	First Break	Denoising	Migration induced				Supervised	CNN	U-NET	Synthetic	Both		Post-stack migrated	L2 norm
2020	Leveraging deep learning for seismic image denoising	https://doi.org/10.3997/1365-2397.fb2020048	Klochikhina		X	EAGE	First Break	Denoising	Migration induced				Supervised	CNN	U-NET	Synthetic	Both		Post-stack migrated	L2 norm
2020	An Adaptive Anomalous Amplitude Attenuation Method Based on Deep Neural Network	https://doi.org/10.3997/2214-4609.202011320	Tian	X		EAGE	EAGE Annual	Denoising	Anomalous amplitude				Supervised	FCN	VGG 16	Synthetic	Both		Raw seismic Data (Amplitude)	Log loss
2020	Multiples Elimination with Denoising Convolutional Neural Networks: A Case Study in South China Sea	https://doi.org/10.3997/2214-4609.202010256	Ye	X	X	EAGE	EAGE Annual	Denoising	Multiple reflection				Supervised	CNN	user defined	Real	Real		Raw seismic Data (Amplitude)	MSE
2020	Edge-Aware Image Conditioning with a Siamese Neural Network	https://doi.org/10.3997/2214-4609.202011144	Aharchaou		X	EAGE	EAGE Annual	Denoising	Enhanced stacking				Supervised	CNN	VGG 16	Real			Raw seismic Data (Passive)	Xontrastive Loss
2020	Ground Roll Suppression Using Convolutional Neural Networks	https://doi.org/10.3997/2214-4609.202011650	Oliviera		X	EAGE	EAGE Annual	Denoising	Groundroll				Supervised	GAN	Pix2Pix	Both	Both		Raw seismic Data (Amplitude)	MSE
2019	Seismic High Amplitude Noise Attenuation Based on the Deep Learning Method	https://doi.org/10.3997/2214-4609.201901356	Zhu	X		EAGE	EAGE Annual	Denoising	Random				Supervised	CNN		Real	Real		Raw seismic Data (Amplitude)	Normalized squared difference
2019	Deep Learning Application in Time-Frequency Analysis for Noise Attenuation	https://doi.org/10.3997/2214-4609.201977037	Hamidi	X		EAGE	Conference on Reservoir Geoscience	Denoising	Random				Supervised	CNN	U-NET	Synthetic	Synthetic			MSE
2019	Seismic Image Denoising Using Convolutional Neural Network with Residual Learning Approach	https://doi.org/10.3997/2214-4609.201900851	Wu	X		EAGE	EAGE Annual	Denoising	Random				Supervised	CNN-Resnet		Both	Real		Post-stack migrated	L1 norm
2019	Using Convolutional Neural Networks for Denoising and Deblending of Marine Seismic Data	https://doi.org/10.3997/2214-4609.201900844	Slang	X	X	EAGE	EAGE Annual	Denoising	Seismic interference (Marine)	Event separation	deblending		Supervised	CNN		Real	Real		Raw seismic Data (Amplitude)	
2018	Deep Learning for Attenuating Random and Coherence Noise Simultaneously	https://doi.org/10.3997/2214-4609.201800939	Yu	X		EAGE	EAGE Annual	Denoising	Multiple (cycle skipping potential, rig noise, data reduction)				Supervised	CNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	
2018	PDF SCoherent Linear Noises Attenuation From 3D Seismic Data Using Artificial Neural Network: Application To Algerian Sahara	https://doi.org/10.3997/2214-4609.201802176	Ouadfeul	X		EAGE	ECMOR XVI	Denoising	multiple (linear, groundroll)				Supervised	MLP	user defined	Real	Real		Raw seismic Data (Amplitude)	MSE
2019	Deep learning for denoising	https://doi.org/10.1190/geo2018-0668.1	Yu	X		SEG	Geophysics	Denoising	multiple (random, linear, multiples, groundroll)				Supervised	CNN		Synthetic	Synthetic			multiple (MSE, Normalized squared difference)
2014	How to Teach a Neural Network to Identify Seismic Interference	https://doi.org/10.3997/2214-4609.20141445	Rentsch	X	X	EAGE	EAGE Annual	Denoising	Seismic interference (Marine)				Supervised	MLP		Synthetic	Real		Raw seismic Data (Amplitude)	
2018	Random Noise Attenuation Using Convolutional Neural Networks	https://doi.org/10.3997/2214-4609.201801390	Liu	X		EAGE	EAGE Annual	Denoising	Random				Supervised	CNN	U-NET	Synthetic	Synthetic		Raw seismic Data (Amplitude)	L1 norm
2018	Generative Adversarial Networks for Seismic Data Interpolation	https://doi.org/10.1190/AIML2018-11.1	Chang		X	SEG	Workshop: SEG Maximizing Asset Value Through Artificial Intelligence and Machine Learning, Beijing, China	Trace Interpolation					Semi-supervised	GAN		Real	Real		Migrated	
2019	Interpolation of regularly sampled prestack seismic data with self-supervised learning	https://doi.org/10.1190/segam2019-3215774.1	Sen		X	SEG	SEG Technical Program	Trace Interpolation					Self-learning	Variational auto encoder		real	Real		Raw seismic Data (Amplitude)	
2018	Generative adversarial networks in seismic data processing	https://doi.org/10.1190/segam2018-2996002.1	Alwon		X	SEG	SEG Technical Program	Trace Interpolation		Denoising	Random		Semi-supervised	GAN						
2018	Seismic data interpolation through convolutional autoencoder	https://doi.org/10.1190/segam2018-2995428.1	Mandelli	X		SEG	SEG Technical Program	Trace Interpolation					Supervised	CNN	U-Net	Real	Real		Raw seismic Data (Amplitude)	MSE
2017	What can machine learning do for seismic data processing? An interpolation application	https://doi.org/10.1190/geo2016-0300.1	Jia	X		SEG	Geophysics	Trace Interpolation					Supervised	SVR		Synthetic	Both		Raw seismic Data (Amplitude)	
2019	Deep-learning-based seismic data interpolation: A preliminary result	https://doi.org/10.1190/geo2017-0495.1	Wang	X		SEG	Geophysics	Trace Interpolation					Supervised	CNN	ResNet	Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Seismic trace interpolation for irregularly spatial sampled data using convolutional autoencoder	https://doi.org/10.1190/geo2018-0699.1	Wang	X		SEG	Geophysics	Trace Interpolation					Supervised	Auto-encoder		Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Can learning from natural image denoising be used for seismic data interpolation?	https://doi.org/10.1190/geo2019-0243.1	Zhang	X		SEG	Geophysics	Trace Interpolation					Supervised	CNN		Synthetic	Both		Raw seismic Data (Amplitude)	
2020	De-aliasing using the U-Net image segmentation algorithm	https://doi.org/10.1190/segam2020-3425878.1	Yvas		X	SEG	SEG Technical Program	Trace Interpolation					Supervised	CNN	U-Net	Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Seismic data reconstruction based on super resolution convolutional neural network	https://doi.org/10.1190/bwds2020_11.1	Jun	X		SEG	SEG 2020 Workshop: Broadband and Wide-azimuth Deepwater Seismic technilogy, Beijing, China	Trace Interpolation					Supervised	SRCNN (Super resolution CNN)		Real	Real		Raw seismic Data (Amplitude)	MSE
2020	Crossline interpolation with the traces-to-trace approach using machine learning	https://doi.org/10.1190/segam2020-3428348.1	Yeeh	X		SEG	SEG Technical Program	Trace Interpolation					Supervised	RNN-LSTM		Synthetic	Synthetic	SEAM	Raw seismic Data (Amplitude)	
2021	Reconstruction of Irregular Missing Seismic Data Using Conditional Generative Adversarial Networks	https://doi.org/10.1190/geo2020-0644.1	Wei	X	X	SEG	Geophysics	Trace Interpolation					Supervised	GAN	multiple (U-NET, Pix2Pix)	Synthetic	Both		Raw seismic Data (Amplitude)	multiple (L1 norm,Adversial)
2021	Deep-seismic-prior-based reconstruction of seismic data using convolutional neural networks	https://doi.org/10.1190/geo2019-0570.1	Liu	X		SEG	Geophysics	Trace Interpolation					Supervised	CNN	U-NET	Synthetic	Both		Raw seismic Data (Amplitude)	
2021	A method for adequate selection of training data sets to reconstruct seismic data using a convolutional U-Net	https://doi.org/10.1190/geo2019-0708.1	Park	X	X	SEG	Geophysics	Trace Interpolation					Supervised	CNN	U-NET	Both	Both		Raw seismic Data (Amplitude)	
2021	Seismic data interpolation based on U-net with texture loss	https://doi.org/10.1190/geo2019-0615.1	Fang	x		SEG	Geophysics	Trace Interpolation					Supervised	CNN	U-NET	Synthetic	Both	Marmousi	Raw seismic Data (Amplitude)	Log loss
2021	Dealiased seismic data interpolation using a deep-learning-based prediction-error filter	https://doi.org/10.1190/geo2020-0487.1	Fang	X		SEG	Geophysics	Trace Interpolation					Supervised	CNN		Synthetic	Both		Raw seismic Data (Amplitude)	MSE
2021	Self-supervised learning for anti-aliasing seismic data interpolation	https://doi.org/10.1190/segam2021-3584206.1	Yuan	X	X	SEG	SEG Technical Program	Trace Interpolation					Unsupervised	Not specified		Synthetic	Synthetic	SEAM	Raw seismic Data (Amplitude)	
2021	Machine learning for seismic processing: The path to fulfilling promises	https://doi.org/10.1190/segam2021-3590137.1	Hou		X	SEG	International Meeting for Applied Geoscience & Energy	Trace Interpolation		Denoising	Random	Event separation	deblending	Supervised	CNN	U-NET	Real	Real		Raw seismic Data (Amplitude)	
2021	Seismic data interpolation using deep learning with generative adversarial networks	https://doi.org/10.1111/1365-2478.13055	Kaur	X		EAGE	Geophysical Prospecting	Trace Interpolation					Supervised	GAN	ResNet	Synthetic	Both	Marmousi/BP 2004	Raw seismic Data (Amplitude)	multiple (Adversial, cyclic)
2020	Reconstructing Missing Seismic Data through Deep Learning with Recurrent Inference Machines	https://doi.org/10.3997/2214-4609.202011046	Kuijpers	X		EAGE	EAGE Annual	Trace Interpolation					Supervised	RNN		Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Deep Learning for Seismic Data Reconstruction: Opportunities and Challenges	https://doi.org/10.3997/2214-4609.202032054	Ovcharenko	X	X	EAGE	Digitalization conference	Trace Interpolation		Denoising	Random		Supervised	multiple (CNN, GAN)	multiple (U-NET, U-GAN, GMCNN)	Real	Real		Raw seismic Data (Amplitude)	multiple (L1 norm, Adversial)
2019	Spatial aliasing removal using deep learning super-resolution	https://doi.org/10.3997/1365-2397.n0057	Garg	X		EAGE	First Break	Trace Interpolation					Supervised	GAN		Synthetic	Synthetic	Marmousi/Sigsbee	Raw seismic Data (Passive)	multiplle (L1 norm, L2 norm)
2018	Seismic Data Interpolation Using Deep Learning Based Residual Networks	https://doi.org/10.3997/2214-4609.201801394	Wang	X		EAGE	EAGE Annual	Trace Interpolation					Supervised	CNN	user defined	Synthetic	Both		Raw seismic Data (Amplitude)	

2018	A Quantitative Comparison of Two Convolutional Neural Network Architectures - Seismic Data Interpolation as Example	https://doi.org/10.3997/2214-4609.201801395	Wang	X			EAGE	EAGE Annual	Trace Interpolation					Supervised	CNN	user defined	Synthetic	Synthetic		Raw seismic Data (Amplitude)	
2018	Intelligent interpolation by Monte Carlo machine learning	https://doi.org/10.1190/geo2017-0294.1	Jia	X			SEG	Geophysics	Trace Interpolation					Supervised			Synthetic				
2020	Can learning from natural image denoising be used for seismic data interpolation?	https://doi.org/10.1190/geo2019-0243.1	Zhang	X			SEG	Geophysics	Trace Interpolation					Supervised	CNN	user defined	Synthetic				MSE
2020	Synthesizing seismic diffractions using a generative adversarial network	https://doi.org/10.1190/segam2020-3415521.1	Durall	X			SEG	SEG Technical Program	Event separation	Diffraction				Semi-supervised	GAN		Both	Both		Pre-stack migrated	
2020	Extraction of diffraction events from seismic data using deep learning-based approach	https://doi.org/10.1190/segam2020-3424217.1	Kim	X			SEG	SEG Technical Program	Event separation	Diffraction				Supervised	CNN	U-Net	Synthetic	Synthetic	SMAART JV (Gulf of Mexico)	Raw seismic Data (Amplitude)	
2020	A convolutional neural network approach to deblending seismic data	https://doi.org/10.1190/geo2019-0173.1	Sun	X	X		SEG	Geophysics	Event separation	Deblending				Supervised	CNN		Real	Real		Raw seismic Data (Amplitude)	
2021	Wavefield decomposition for diffraction separation with convolutional neural networks	https://doi.org/10.1190/segam2021-3584040.1	Bauer	X			SEG	International Meeting for Applied Geoscience & Energy	Event separation					Supervised	CNN	U-NET	Synthetic	Both		Raw seismic Data (Amplitude)	
2021	Building training data set for deep learning-based P- and S-wave separation: Field data case	https://doi.org/10.1190/segam2021-3583348.1	Wei	X			SEG	International Meeting for Applied Geoscience & Energy	Event separation	Multiple (deblending, P- and S-wave)				Supervised	FCNN		Synthetic	Both		Raw seismic Data (Amplitude)	
2019	Multi-Domain Diffraction Identification Using Deep Learning	https://doi.org/10.3997/2214-4609.201901208	Lowney	X	X	X	EAGE	EAGE Annual	Event separation	Diffraction				Supervised	CNN		Synthetic			Raw seismic Data (Zero-offset)	
2020	Direct Diffraction Separation by Deep Learning on Pre-Migrated Seismic Data	https://doi.org/10.3997/2214-4609.202010719	Lowney	X	X	X	EAGE	EAGE Annual	Event separation	Diffraction				Supervised	GAN	multiple (U-NET, PaatchGan)	Real	Real		Raw seismic Data (Zero-offset)	
2020	Detection of point scatterers using diffraction imaging and deep learning	https://doi.org/10.1111/1365-2478.12889	Tschannen	X		X	EAGE	Geophysical Prospecting	Event separation	Diffraction				Supervised	CNN		Synthetic	Both		Pre-stack migrated	Log loss
2020	Intelligent Seismic Deblending Based Deep Learning Based U-net	https://doi.org/10.3997/2214-4609.202010691	Li	X			EAGE	EAGE Annual	Event separation	Deblending				Supervised	CNN	U-NET	Both	Real		Raw seismic Data (Amplitude)	
2020	P-S Separation from Multi-Component Seismic Data Using Deep Convolutional Neural Networks	https://doi.org/10.3997/2214-4609.202010617	Xiong	X			EAGE	EAGE Annual	Event separation	P- and S-wave				Supervised	CNN	U-NET	Synthetic	Synthetic	Marmousi II/Hess	Raw seismic Data (multi-component, angle gathers)	L1 norm
2020	Seismic Processing with Deep Convolutional Neural Networks: Opportunities and Challenges	https://doi.org/10.3997/2214-4609.202010647	Hou		X		EAGE	EAGE Annual	Event separation	Deblending				Supervised	CNN	U-NET	Real	Real		Raw seismic Data (Amplitude)	multiple (L1 norm, L2 norm)
2019	High resolution inversion of seismic wavelet and reflectivity using iterative deep neural networks	https://doi.org/10.1190/segam2019-3216178.1	Chen	X			SEG	SEG Technical Program	Wavelet estimation					Supervised	DNN		Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Deep convolutional neural network and sparse least-squares migration	https://doi.org/10.1190/geo2019-0412.1	Liu	X	X		SEG	Geophysics	Migration	Least-square				Supervised	CNN		Synthetic	Both			
2021	Seismic nonstationary deconvolution with physics-guided autoencoder	https://doi.org/10.1190/segam2021-3582130.1	Phan	X			SEG	International Meeting for Applied Geoscience & Energy	Deconvolution					Unsupervised	Auto-encoder		Synthetic	Synthetic		Post-stack migrated	
2021	Optimized plane-wave least-squares reverse time migration via a convolutional network	https://doi.org/10.1190/segam2021-3583931.1	Huang	X			SEG	International Meeting for Applied Geoscience & Energy	Migration	Least-square				Supervised	CNN	U-NET	Synthetic	Synthetic	Marmousi	Raw seismic Data (Zero-offset)	
2021	Nonstretching NMO correction using deep learning	https://doi.org/10.1190/segam2021-3580806.1	Kaur	X			SEG	International Meeting for Applied Geoscience & Energy	NMO correction					Supervised	GAN		Synthetic	Synthetic		Raw seismic Data (CMP)	
2021	Deep learning based least-squares reverse time migration	https://doi.org/10.1190/segam2021-3581036.1	Torres	X			SEG	International Meeting for Applied Geoscience & Energy	Migration	Least-square				Supervised	CNN	U-NET	Synthetic	Synthetic	Marmousi	Raw seismic Data (Zero-offset)	MSE
2021	Minibatch least-squares reverse time migration in a deep-learning framework	https://doi.org/10.1190/geo2019-0707.1	Vamaraju		X		SEG	Geophysics	Migration	Least-square				Supervised	RNN		Synthetic	Synthetic	Marmousi/SEG salt model		Huber
2021	Deep learning for multitrace sparse-spike deconvolution	https://library.seg.org/doi/epub/10.1190/geo2020-0342.1	Chai	X			SEG	Geophysics	Sparse-Spike deconvolution (SSD)						CNN	user defined	Synthetic	Both			MSE
2020	Extracting Fresnel Zone from Migrated Dip-Angle Gather Using Convolutional Neural Network	https://doi.org/10.3997/2214-4609.202010730	Cheng	X			EAGE	EAGE Annual	Fresnel Zone					Supervised	CNN	VGG 16	Both	Real			MSE
2019	Extraction of the Seismic Wavelet Based on Deep Neural Networks	https://doi.org/10.3997/2214-4609.201901378	Lu	X			EAGE	EAGE Annual	Wavelet estimation					Supervised	multiple (GAN, DNN)		Synthetic	Real		Post-stack migrated	Normalized squared difference
2019	Neural Network Least Squares Migration	https://doi.org/10.3997/2214-4609.201900831	Liu	X			EAGE	EAGE/SBGF on Least square migration	Migration	Least-square				Unsupervised	Convolutional sparse coding		Synthetic	Synthetic			MSE
2018	Neural Network Least Squares Migration	https://doi.org/10.3997/2214-4609.201803061	Liu	X			EAGE	EAGE/SBGF on Least square migration	Migration	Least-square				Unsupervised	Convolutional sparse coding		Synthetic	Synthetic			MSE
2019	An implementation of the seismic resolution enhancing network based on GAN	https://doi.org/10.1190/segam2019-3216229.1	Zhang		X		SEG	SEG Technical Program	Frequency extrapolation	High frequency				Semi-supervised	GAN		Real	Real		Post-stack	
2018	Deep learning-enabled seismic image enhancement	https://doi.org/10.1190/segam2018-2996943.1	Halpert		X		SEG	SEG Technical Program	Frequency extrapolation	High frequency				Supervised	GAN		Synthetic	Synthetic	SEAM	Post-stack migrated	
2021	Deep learning spectral enhancement considering features of seismic field data	https://doi.org/10.1190/geo2020-0017.1	Choi	X	X		SEG	Geophysics	Frequency extrapolation	High frequency				Supervised	CNN	U-NET	Synthetic	Both		Post-stack migrated	
2020	Improving Seismic Resolution by a Sequential Convolutional Neural Network	https://doi.org/10.3997/2214-4609.202010836	Yuan	X	X		EAGE	EAGE Annual	Frequency extrapolation	High frequency				Supervised	SCNN (Sequential CNN)		Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE
2019	Extrapolated full waveform inversion with convolutional neural networks	https://doi.org/10.1190/segam2019-3197987.1	Sun	X			SEG	SEG Technical Program	Frequency extrapolation	Low Frequency				Supervised	CNN		Synthetic	Synthetic			
2020	Self-supervised learning for low frequency extension of seismic data	https://doi.org/10.1190/segam2020-3427086.1	Wang		X		SEG	SEG Technical Program	Frequency extrapolation	Low Frequency				Supervised	CNN	U-Net	Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Data-driven low-frequency signal recovery using deep-learning predictions in full-waveform inversion	https://doi.org/10.1190/geo2020-0159.1	Fang	X	X		SEG	Geophysics	Frequency extrapolation	Low Frequency				Supervised	CNN		Synthetic	Synthetic	Marmousi/Over thrust 3D model	Raw seismic Data (Amplitude)	
2020	Physics-guided self-supervised learning for low frequency data prediction in FWI	https://doi.org/10.1190/segam2020-3423396.1	Hu	X			SEG	SEG Technical Program	Frequency extrapolation	Low Frequency				Semi-supervised	PGNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	
2020	Extrapolated full-waveform inversion with deep learning	https://doi.org/10.1190/geo2019-0195.1	Sun	X			SEG	Geophysics	Frequency extrapolation	Low Frequency				Supervised	CNN		Synthetic	Synthetic	Marmousi/BP 2004	Raw seismic Data (Amplitude)	MSE
2020	Machine-learning based data recovery and its benefit to seismic acquisition: Deblending, data reconstruction, and low-frequency extrapolation in a simultaneous fashion	https://doi.org/10.1190/segam2020-3399306.1	Nakayama	X			SEG	SEG Technical Program	Frequency extrapolation	Low Frequency	Trace Interpolation	Event separation	deblending	Supervised	CNN	U-Net	Both	Both		Raw seismic Data (Passive)	
2021	Machine-learning-based data recovery and its contribution to seismic acquisition: Simultaneous application of deblending, trace reconstruction, and low-frequency extrapolation	https://doi.org/10.1190/geo2020-0303.1	Nakayama	X	X		SEG	Geophysics	Frequency extrapolation	Low Frequency	Trace Interpolation	Event separation	deblending	Supervised	CNN	U-NET	Both	Both		Raw seismic Data (Amplitude)	
2020	FWI with reconstructed low frequency data: A label-free physics-integrated deep learning approach	https://doi.org/10.3997/2214-4609.202084006	Hu	X	X		EAGE	EAGE Annual	Frequency extrapolation	Low Frequency				Supervised	DNN					Raw seismic Data (Amplitude)	
2020	Deep Learning of Bandwidth Extension from Seabed Seismic	https://doi.org/10.3997/2214-4609.202011111	Aharchaou		X		EAGE	EAGE Annual	Frequency extrapolation	Low Frequency				Supervised		Seq2Seq	Real	Real		Raw seismic Data (Amplitude)	
2020	Extrapolation of Low Wavenumbers in FWI Gradients by a Deep Convolutional Neural Network	https://doi.org/10.3997/2214-4609.202011988	Plotnitskii	X			EAGE	EAGE Annual	Frequency extrapolation	Low Frequency				Supervised	CNN	U-NET	Synthetic	Synthetic	Marmousi II	Raw seismic Data (Amplitude)	R2
2020	Generating Seismic Low Frequencies with a Deep Recurrent Neural Network for Full Waveform Inversion	https://doi.org/10.3997/2214-4609.202037023	Fabien-Ouellet	X			EAGE	Seismic inversion conference	Frequency extrapolation	Low Frequency				Supervised	RNN		Synthetic	Synthetic	BP 2004	Raw seismic Data (Amplitude)	
2019	Realistically Textured Random Velocity Models for Deep Learning Applications	https://doi.org/10.3997/2214-4609.201901340	Kazei	X			EAGE	EAGE Annual	Frequency extrapolation	Low Frequency				Supervised	CNN	Mobilenet	Synthetic	Synthetic	Marmousi	Raw seismic Data (Amplitude)	
2019	Deep learning for low-frequency extrapolation from multioffset seismic data	https://doi.org/10.1190/geo2018-0884.1	Ovcharenko	X			SEG	Geophysics	Frequency extrapolation	Low Frequency				Supervised	CNN	user defined	Synthetic	Synthetic		Raw seismic Data (Amplitude)	L2 norm
2019	A deep learning approach for acoustic FWI with elastic data	https://doi.org/10.1190/segam2019-3215952.1	Li	X	X		SEG	SEG Technical Program	VMB	Raw				Supervised	CNN						

2019	Classifying geological structure elements from seismic images using deep learning	https://doi.org/10.1190/segam2019-3216823.1	Xu	X		SEG	SEG Technical Program	VMB	Raw		Supervised	PINN (Physics-informed NN)							
2017	Deep learning prior models from seismic images for full-waveform inversion	https://doi.org/10.1190/segam2017-17627643.1	Lewis		X	SEG	SEG Technical Program	VMB	FWI		Supervised	CNN	AlexNet	Synthetic	Both		Post-stack migrated		
2019	Deep learning-driven velocity model building workflow	https://doi.org/10.1190/tle38110872a1.1	Araya-Polo	X	X	SEG	TLE	VMB	Raw		Semi-supervised	GAN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE	
2019	Deep-learning inversion: A next-generation seismic velocity model building method	https://doi.org/10.1190/geo2018-0249.1	Yang	X		SEG	Geophysics	VMB	Raw		Supervised	FCN	U-net	Synthetic	Both	SEG Salt model	Raw seismic Data (Amplitude)	MSE	
2020	CycleFCN: A physics-informed data-driven seismic waveform inversion method	https://doi.org/10.1190/segam2020-w13-05.1	Jin	X		sEG	SEG Technical Program	VMB	Raw		Supervised	PINN (Physics-informed NN)		Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE	
2020	A theory-guided deep-learning formulation and optimization of seismic waveform inversion	https://doi.org/10.1190/geo2019-0138.1	Sun	X		SEG	Geophysics	VMB	Raw		Supervised	RNN		Synthetic	Synthetic	Marmousi	Raw seismic Data (Amplitude)		
2020	Application of deep learning optimization algorithm in full waveform inversion	https://doi.org/10.1190/iwmg2019_03.1	You	X		SEG	SEG Technical Program	VMB	Raw		Supervised	DNN		Synthetic	Synthetic	Marmousi			
2020	Seismic velocity estimation: A deep recurrent neural-network approach	https://doi.org/10.1190/geo2018-0786.1	Fabien-Ouellet	X		SEG	Geophysics	VMB	Raw		Supervised	RNN-LSTM		Synthetic	Both		Raw seismic Data (CMP)	Log loss	
2020	Velocity model building by deep learning: From general synthetics to field data application	https://doi.org/10.1190/segam2020-3428324.1	Kazei	X		SEG	SEG Technical Program	VMB	Raw		Supervised	CNN	VGG	Synthetic	Both	Marmousi	Raw seismic Data (CMP)		
2020	Elastic near-surface model estimation from full waveforms by deep learning	https://doi.org/10.1190/segam2020-w13-06.1	Kazei	X	X	SEG	SEG Technical Program	VMB	Raw		Supervised	CNN		Synthetic	Synthetic	SEAM	Raw seismic Data (Amplitude)		
2020	ML-descent: An optimization algorithm for full-waveform inversion using machine learning	https://doi.org/10.1190/geo2019-0641.1	Sun	X		SEG	Geophysics	VMB	Latent space		Supervised	RNN-LSTM		Synthetic	Synthetic	Marmousi/Over thrust 3D model	Raw seismic Data (Amplitude)	L2 norm	
2021	Seismic inversion via closed-loop fully convolutional residual network and transfer learning	https://doi.org/10.1190/geo2020-0297.1	Wang	X		SEG	Geophysics	VMB	Raw		Supervised	CNN		Both	Both	Marmousi II	Post-stack migrated	MSE	
2021	Reparameterized full-waveform inversion using deep neural networks	https://doi.org/10.1190/geo2019-0382.1	He	X		SEG	Geophysics	VMB	Raw		Supervised	DNN		Synthetic	Synthetic	Marmousi II/BP 2004	Raw seismic Data (Amplitude)		
2021	Deep-Learning Inversion of Seismic Data	https://doi.org/10.1109/TGRS.2019.2953473	Li	X		IEEE	Transactions on Geoscience and Remote Sensing	VMB	Raw		Supervised	CNN					Raw seismic Data (Amplitude)		
2021	Deep-learning seismic full-waveform inversion for realistic structural models	https://doi.org/10.1190/geo2019-0435.1	Liu	X		SEG	Geophysics	VMB	Raw		Supervised	CNN	user defined	Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE	
2021	Neural network seismic velocity model building: A frequency-stepping approach	https://doi.org/10.1190/segam2021-3584519.1	Alzahrani			SEG	International Meeting for Applied Geoscience & Energy	VMB	Raw		Supervised	RNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)		
2021	Physics-guided deep learning for seismic inversion with hybrid training and uncertainty analysis	https://doi.org/10.1190/geo2020-0312.1	Sun	X		SEG	Geophysics	VMB	Raw		Supervised	multiple (CNN, DNN, PINN)		Synthetic	Synthetic	SEG/EAGE salt model	Raw seismic Data (Amplitude)		
2021	Metallic deposits imaging based on U-net deep learning method	https://doi.org/10.1190/segam2021-3582815.1	Wan	X		SEG	International Meeting for Applied Geoscience & Energy	VMB	Raw		Supervised	CNN	U-NET	Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE	
2021	Deep learning for joint geophysical inversion of seismic and MT data sets	https://doi.org/10.1190/segam2021-3583955.1	Singh	X		SEG	International Meeting for Applied Geoscience & Energy	VMB	Raw		Supervised	ANN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE	
2020	ML-Misfit: Learning a Robust Misfit Function for Full-Waveform Inversion Using Machine Learning	https://doi.org/10.3997/2214-4609.202010466	Sun	X		EAGE	EAGE Annual	VMB	Raw		Supervised			Synthetic	Synthetic	Marmousi	Raw seismic Data (Amplitude)	Hinge	
2020	High-Resolution Regularized Elastic Full Waveform Inversion Assisted by Deep Learning	https://doi.org/10.3997/2214-4609.202010281	Li	X		EAGE	EAGE Annual	VMB	Raw			DNN		Synthetic	Both		Raw seismic Data (Amplitude)		
2020	Deep Learning Tomography by Mapping Full Seismic Waveforms to Vertical Velocity Profiles	https://doi.org/10.3997/2214-4609.202011980	Kazei	X		EAGE	EAGE Annual	VMB	Pre-stack		Supervised	CNN		Synthetic	Synthetic	Marmousi/ Marmousi II/Over thrust 3D model	Raw seismic Data (CMP)		
2020	A Deep-Learning inversion method for seismic velocity model building	https://doi.org/10.3997/2214-4609.202084014	Targino	X		EAGE	Conference on Machine Learning in Americas	VMB	Raw		Supervised	CNN	U-NET	Synthetic	Synthetic	Marmousi II	Raw seismic Data (Amplitude)		
2020	Optimizing Deep Convolutional Neural Networks for 2D Full Waveform Inversion	https://doi.org/10.3997/2214-4609.202011454	Puzyrev	X		EAGE	EAGE Annual	VMB	Raw		Supervised	CNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)		
2019	Elastic Pre-stack Seismic Inversion in Stratified Media Using Machine Learning	https://doi.org/10.3997/2214-4609.201901524	Zheng		X	EAGE	EAGE Annual	VMB	Raw		Supervised	CNN		Synthetic	Real		Raw seismic Data (Amplitude)		
2019	Velocity Model Building from Raw Shot Gathers Using Machine Learning	https://doi.org/10.3997/2214-4609.201901522	Oye		X	EAGE	PESGB	VMB	Raw		Supervised	CNN		Synthetic	Both	Marmousi	Raw seismic Data (Amplitude)		
2019	Physics-Based Machine Learning Inversion of Subsurface Elastic Properties	https://doi.org/10.3997/2214-4609.201901147	Costa Nogueira Junior		X	EAGE	EAGE Annual	VMB	Raw		Supervised	PINN (Physics-informed NN)		Synthetic	Synthetic		Raw seismic Data (Amplitude)	L2 norm	
2019	Automated Velocity Estimation by Deep Learning Based Seismic-to-Velocity Mapping	https://doi.org/10.3997/2214-4609.201901523	Duque	X		EAGE	EAGE Annual	VMB	Raw		Supervised	GAN		Synthetic	Synthetic	Over thrust 3D model	Raw seismic Data (Amplitude)	Log loss	
2019	Seismic Inversion with Deep Neural Networks: a Feasibility Analysis	https://doi.org/10.3997/2214-4609.201900765	Puzyrev	X		EAGE	EAGE Annual	VMB	Raw		Supervised	CNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE	
2018	Tomography: a Deep Learning vs Full-Waveform Inversion Comparison	https://doi.org/10.3997/2214-4609.201803073	Farris	X	X	EAGE	HPCUP (HIGH PERFORMANCE COMPUTING FOR UPSTREAM)	VMB	Sembelance		Supervised			Synthetic	Synthetic		Velocity Sembelance	MSE	
2018	Pre-Stack Seismic Inversion With Deep Learning	https://doi.org/10.3997/2214-4609.201803008	Zheng		X	EAGE	PESGB	VMB	Raw		Supervised	CNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)		
2018	Rapid Seismic Domain Transfer: Seismic Velocity Inversion and Modeling Using Deep Generative Neural Networks	https://doi.org/10.3997/2214-4609.201800734	Mosser	X	X	EAGE	EAGE Annual	VMB	Migrated		Semisupervised	GAN		Synthetic	Both	Marmousi	Pre-stack migrated		
2020	Velocity model building in a crosswell acquisition geometry with	https://doi.org/10.1190/geo2018-0591.1	Wang	X		SEG	Geophysics	VMB	Raw		Supervised	FCN	VMB	Synthetic	Synthetic			Normalized squared difference	
2019	Deep-learning inversion: a next generation seismic velocity-model building	https://doi.org/10.1190/geo2018-0249.1	Yang	X		SEG	Geophysics	VMB	Raw		Supervised	FCN	VMB	Synthetic	Synthetic		Raw seismic Data (Amplitude)	Normalized squared difference	
2018	U-net convolutional networks for first arrival picking	https://doi.org/10.1190/AIML2018-04.1	Hu	X	X	SEG	Workshop: SEG Maximizing Asset Value Through Artificial Intelligence and Machine Learning, Beijing, China	Firstbreak picking	Active		Supervised	CNN	U-Net	Real	Real		Raw seismic Data (Amplitude)		
2018	Application of deep learning in first break picking of seismic data	https://doi.org/10.1190/AIML2018-05.1	Pu		X	SEG	SEG Maximizing Asset Value Through Artificial Intelligence and Machine Learning, Beijing, China	Firstbreak picking	Active		Supervised	CNN		Real	Real		Raw seismic Data (Amplitude)		
2019	First arrival picking using U-net with Lovasz loss and nearest point picking method	https://doi.org/10.1190/segam2019-3214404.1	Yuan	X	X	SEG	SEG Technical Program	Firstbreak picking	Active		Supervised	CNN	U-Net	Both	Both		Raw seismic Data (Amplitude)	Hinge loss	
2019	First-break automatic picking with fully convolutional networks and transfer learning	https://doi.org/10.1190/segam2019-3215277.1	Xie	X	X	SEG	SEG Technical Program	Firstbreak picking	Active		Supervised	FCN		Real	Real		Raw seismic Data (Amplitude)	Log loss	
2019	Automatic first arrival picking for borehole seismic data using a pixel-level network	https://doi.org/10.1190/segam2019-3216775.1	Ma	X		SEG	SEG Technical Program	Firstbreak picking	Active		Supervised	CNN	U-Net	Real	Real		Raw seismic Data (Amplitude)		
2019	Detecting P- and S-wave arrivals with a recurrent neural network	https://doi.org/10.1190/segam2019-3215081.1	Kirschner	X	X	SEG	SEG Technical Program	Firstbreak picking	Passive		Supervised	RNN-LSTM							
2018	First-break automatic picking with deep semisupervised learning neural network	https://doi.org/10.1190/segam2018-2998106.1	Chun Tsai	X	X	SEG	SEG Technical Program	Firstbreak picking	Active		Semi-supervised	DNN		Real	Real		Raw seismic Data (Amplitude)		
2018	Using a deep convolutional neural network to enhance the accuracy of first-break picking	https://doi.org/10.1190/segam2018-2982650.1	Hollander		X	SEG	SEG Technical Program	Firstbreak picking	Active		Supervised	CNN		Real	Real		Raw seismic Data (Amplitude)		
2020	Automated arrival-time picking using a pixel-level network	https://doi.org/10.1190/geo2019-0792.1	Ma	X		SEG	Geophysics	Firstbreak picking	Active		Supervised	CNN	U-net	Real	Real		Raw seismic Data (Amplitude)	Log Loss	
2020	Direct seismic waveform classification and first-break picking based on fully convolutional networks from shot gathers with missing traces	https://doi.org/10.1190/iwmg2019_07.1	Zhao	X		SEG	SEG 2019 Workshop: Mathematical Geophysics: Traditional vs Learning, Beijing	Firstbreak picking	Active		Supervised	FCN		Real	Real		Raw seismic Data (Amplitude)		

2020	Convolutional neural networks for microseismic waveform classification and arrival picking	https://doi.org/10.1190/geo2019-0267.1	Zhang	X			SEG	Geophysics	Firstbreak picking	Passive	Passive	Microseismic		Supervised	CNN		Synthetic	Both		Raw seismic Data (Amplitude)	
2020	Automated first break picking with constrained pooling networks	https://doi.org/10.1190/segam2020-3427812.1	Cova		X		SEG	SEG Technical Program	Firstbreak picking	Active				Supervised	CNN	U-Net	Real	Real		Raw seismic Data (Amplitude)	
2020	Using neural networks to detect microseismicity and pick P-wave arrival times in Oklahoma	https://doi.org/10.1190/segam2020-3417918.1	Luo	X			SEg	SEG Technical Program	Firstbreak picking	Passive	Passive	Microseismic		Supervised	CNN		Real	Real		Frequency-time	Log loss
2021	Acquisition/Processing: AI-complemented first-break picking for field low-S/N seismic data	https://doi.org/10.1190/tle40060460.1	Woog	X			SEG	TLE	Firstbreak picking	Active				Supervised	CNN		Real	Real		Raw seismic Data (Amplitude)	
2021	Enhancing Seismic Image Quality through an Automatic Refraction Static Correction: A Machine Learning Application in Web Based Seismic Processing	https://doi.org/10.3997/2214-4609.202171013	Wardaya				EAGE	EAGE Asia Pacific Virtual Geoscience Week	Firstbreak picking	Active							Real	Real		Raw seismic Data (Amplitude)	
2020	Convolutional Neural Network for First Break Picking in Land Seismic Surveys	https://doi.org/10.3997/2214-4609.202011754	Kalashnikov		X		EAGE	EAGE Annual	Firstbreak picking	Active				Supervised	CNN	U-NET	Real			Raw seismic Data (Passive)	
2019	The First-Break Detection For Real Seismic Data With Use of Convolutional Neural Network	https://doi.org/10.3997/2214-4609.201901614	Loginov	X	X		EAGE	EAGE Annual	Firstbreak picking	Active				Supervised	CNN		Real	Real		Raw seismic Data (Amplitude)	
2018	Can Machines Learn To Pick First Breaks As Humans Do?	https://doi.org/10.3997/2214-4609.201803026	Yalcinoglu		X		EAGE	PESGB	Firstbreak picking	Active					SVM		Real	Real		Raw seismic Data (Amplitude)	
2018	Automatic Seismic First Arrival Picking With Deep-Learning	https://doi.org/10.3997/2214-4609.201803023	Xie		X		EAGE	PESGB	Firstbreak picking	Active				Supervised	FCNN	U-NET	Real	Real		Raw seismic Data (Amplitude)	Log loss
2018	Deep Neural Network and Multi-pattern Based Algorithm for Picking First-arrival Traveltimes	https://doi.org/10.3997/2214-4609.201801109	Mezyk	X			EAGE	EAGE Annual	Firstbreak picking	Active				Supervised	CNN			Real		Raw seismic Data (Amplitude)	
2011	The Improvement of Neural Network Cascade-correlation Algorithm and its Application in Picking Seismic First Break	https://doi.org/10.3997/2214-4609.20149418	Song	X			EAGE	EAGE Annual	Firstbreak picking	Active				Supervised			Real	Real			
2014	Novel hybrid artificial neural network based autopicking workflow for passive seismic data	https://doi.org/10.1111/1365-2478.12125	Maity	X		X	EAGE	Geophysical Prospecting	Firstbreak picking	Passive				Supervised	MLP		Synthetic	Synthetic			Log mean square
2020	A density-based spatial clustering application for a fully automatic picking of surface wave dispersion curves	https://doi.org/10.1190/segam2020-3423024.1	Rovetta		X		SEG	SEG Technical Program	Surface waves	DC pick				Unsupervised	DBSCAN		Synthetic	Synthetic	SEAM	Picked DCs	
2020	Detecting the fundamental mode of energy for surface wave analysis, modelling, and inversion, using a deep convolutional network	https://doi.org/10.1190/segam2020-3424584.1	Kaul		X		SEG	SEG Technical Program	Surface waves	DC pick				Supervised	CNN	U-net	Real	Real		Sembelance volume	Dice
2021	Automatic extraction of surface wave dispersion curves using unsupervised learning	https://doi.org/10.1190/segam2021-3582711.1	Yao	X			SEG	International Meeting for Applied Geoscience & Energy	Surface waves	DC pick				Unsupervised	multiple (Kmeans/PCA)		Real	Real			
2021	Application of a density-based spatial clustering algorithm for fully automatic picking of surface-wave dispersion curves	https://doi.org/10.1190/tle40090678.1	Rovetta		X		SEG	TLE	Surface waves	DC pick				Unsupervised	DBSCAN		Both	Both	SEAM	Raw seismic Data (CMP)	
2021	On application issues of automatic dispersion curves picking by machine learning	https://doi.org/10.1190/segam2021-3594524.1	Ren	X	X		SEG	International Meeting for Applied Geoscience & Energy	Surface waves	DC pick				Supervised	CNN	U-NET	Synthetic	Real			L2 norm
2021	An artificial neural network approach for the inversion of surface wave dispersion curves	https://doi.org/10.1111/1365-2478.13107	Yablokov	X		X	EAGE	Geophysical Prospecting	Surface waves	Inversion				Supervised	ANN		Synthetic	Both		Surface Waves (DC)	MSE
2021	A hybrid residual neural network–Monte Carlo approach to invert surface wave dispersion data	https://doi.org/10.1002/nsg.12163	Aleardi	X			EAGE	NSG (Journal)	Surface waves	Inversion				Supervised	RNN					Surface Waves (f-k)	MSE
2020	Separation of multi-mode surface waves by supervised machine learning methods	https://doi.org/10.1111/1365-2478.12927	Li	X			EAGE	Geophysical Prospecting	Surface waves	Modal separation				Supervised	SVM						
2020	Machine-Learning-Driven Dispersion Curve Picking for Surface-Wave Analysis, Modelling, and Inversion	https://doi.org/10.3997/2214-4609.202010598	Kaul		X		EAGE	EAGE Annual	Surface waves	DC pick				Supervised	CNN	U-NET	Real	Real		Raw seismic Data (Amplitude)	Dice
2020	Near Surface Velocity Estimation from Phase Velocity-Frequency Panels with Deep Learning	https://doi.org/10.3997/2214-4609.202010253	Zwartjes		X		EAGE	EAGE Annual	Surface waves	Inversion				Supervised	CNN		Synthetic	Synthetic	SEAM	Surface Waves (f-k)	MSE
2020	Using Convolutional Neural Networks to Expedite the Hamiltonian Monte Carlo Inversion of Rayleigh Wave Dispersion Curves	https://doi.org/10.3997/2214-4609.202020045	Salusti	X			EAGE	NSG	Surface waves	Forward model				Supervised	CNN		Synthetic			Surface Wave (model)	Normalized squared difference
2020	Inversion of Surface Waves Dispersion Curves Using Artificial Neural Network	https://doi.org/10.3997/2214-4609.202010809	Yablokov	X		X	EAGE	EAGE Annual	Surface waves	Inversion				Supervised	FCNN		Synthetic	Synthetic		Surface Waves (DC)	
2019	Near Surface Characterization in Southern Oman: Multi-Wave Inversion Guided by Machine Learning	https://doi.org/10.3997/2214-4609.201900968	Masclet		X		EAGE	EAGE Annual	Surface waves	DC pick				Unsupervised	Kmeans		Real	Real		Surface Waves (DC)	
2019	Near-Real Time 3D Seismic Velocity and Uncertainty Models from Ambient Noise, Gradiometry and Neural Network Inversion	https://doi.org/10.3997/2214-4609.201901993	Curtis	X			EAGE	EAGE Annual	Surface waves	Inversion				Supervised	Mixture density network		Synthetic	Synthetic		Surface Waves (DC)	
2019	Learn to Invert: Surface Wave Inversion with Deep Neural Network	https://doi.org/10.3997/2214-4609.201901965	Hou		X		EAGE	EAGE workshop	Surface waves	Inversion				Supervised	multiple (GAN, DNN)		Real	Real		Surface Waves (DC)	L1 norm
2019	Detecting microseismic events in downhole distributed acoustic sensing data using convolutional neural networks	https://doi.org/10.1190/segam2019-3214863.1	Binder	X			SEG	SEG Technical Program	Passive	Signal detection				Supervised	CNN		Synthetic	Both		Raw seismic Data (Amplitude)	Log loss
2019	Bayesian deep learning and uncertainty quantification applied to induced seismicity locations in the Groningen gas field in the Netherlands: What do we need for safe AI?	https://doi.org/10.1190/segam2019-3216455.1	Gu	X			SEG	SEG Technical Program	Passive	Event location				Supervised	Bayesian-CNN						
2018	Automatic microseismic-event detection via supervised machine learning	https://doi.org/10.1190/segam2018-2998279.1	Qu	X			SEG	SEG Technical Program	Passive	Signal detection				Supervised	SVM		Real	Real		Raw seismic Data (Passive)	MSE
2020	Microseismic event or noise: Automatic classification with convolutional neural networks	https://doi.org/10.1190/segam2020-3414896.1	Consolvo		X		SEG	SEG Technical Program	Passive	Microseismic				Supervised	CNN		Real	Real		Raw (zero offset)	
2020	Predict passive seismic events with a convolutional neural network	https://doi.org/10.1190/segam2020-3425457.1	Wang	X			SEG	SEG Technical Program	Passive	Event detection				Supervised	ANN	VGG	Synthetic	Synthetic		Raw seismic Data (Amplitude)	
2020	Application of machine learning to microseismic event detection in distributed acoustic sensing data	https://doi.org/10.1190/geo2019-0774.1	Stork	X	X		SEG	Geophysics	Passive					Supervised	CNN	YOLOV3	Synthetic	Both		Raw seismic Data (Passive)	multiple (squared error, log)
2021	Microseismic event location using artificial neural networks	https://doi.org/10.1190/segam2021-3582729.1	Anikiev	X			SEG	International Meeting for Applied Geoscience & Energy	Passive	Event detection				Supervised	ANN		Synthetic	Both			
2021	Towards fast DAS passive seismic monitoring combining Compressive Sensing with a deep learning decoder	https://doi.org/10.3997/2214-4609.202131024	Rodriguez		X		EAGE	EAGE GEOTECH	Passive	Event location				Supervised	CNN	U-NET	Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE
2021	Automatic microseismic signals classification with Deep Learning using multi-input Convolutional Neural Networks	https://doi.org/10.3997/2214-4609.202132010	Rajeul		X		EAGE	EAGE Annual	Passive	Signal detection				Supervised	CNN	GoogLeNet	Real	Real		Raw seismic Data (Passive)	
2020	How to Leverage Advanced TensorFlow and Cloud Computing for Efficient Deep Learning on Large Seismic Datasets	https://doi.org/10.3997/2214-4609.202032057	Birnie		X		EAGE	EAGE Annual	Passive	Signal detection				Supervised	CNN	U-NET	Synthetic	Synthetic		Raw seismic Data (Passive)	

2020	Convolutional neural networks for automated microseismic detection in downhole distributed acoustic sensing data and comparison to a surface geophone array	https://doi.org/10.1111/1365-2478.13027	Binder	X			EAGE	Geophysical Prospecting	Passive	Signal detection			Supervised	CNN	user defined	Synthetic	Both		Raw seismic Data (Passive)	Log loss
2020	Enhanced Microseismic Event Detection Using Deep Neural Networks	https://doi.org/10.3997/2214-4609.202010892	Birnie		X		EAGE	EAGE Annual	Passive	Signal detection			Supervised	CNN	U-NET	Synthetic	Both		Raw seismic Data (Passive)	
2019	Performance Review of a Real-Time Machine Learning Based Seismic Catalog Generator in Production	https://doi.org/10.3997/2214-4609.201901241	Reynen				EAGE	EAGE Annual	Passive	Event location										
2019	Automatic Microseismic Event Detection Using Deep Learning: a Classification is Detection Method	https://doi.org/10.3997/2214-4609.201900761	Zhao	X			EAGE	EAGE Annual	Passive	Signal detection			Supervised	CNN	user defined	Real	Real		Raw seismic Data (Passive)	
2018	Data-Driven Signal Recognition- A Machine Learning Application For The Real-Time Microseismic Monitoring	https://doi.org/10.3997/2214-4609.201803007	Shamsa		X		EAGE	PESGB	Passive	Signal detection			Unsupervised	GMM		Real	Real		Raw seismic Data (Passive)	
2018	Event Detection and Phase Picking Based on Deep Convolutional Neural Networks	https://doi.org/10.3997/2214-4609.201801052	Zhu	X			EAGE	EAGE Annual	Passive	Phase detection			Supervised	CNN	user defined	Real	Real		Raw seismic Data (Amplitude)	
2019	Deep learning guiding first-arrival traveltime tomography	https://doi.org/10.1190/segam2019-3215632.1	Li	X			SEG	SEG Technical Program	Traveltime tomography	Inversion			Semi-supervised	GAN		Synthetic	Both		Raw seismic Data (Amplitude)	
2018	Automatic velocity picking with convolutional neural networks	https://doi.org/10.1190/segam2018-2987088.1	Ma		X		SEG	SEG Technical Program	Semblance picking				Supervised	CNN		Synthetic	Synthetic		NMO corrected	
2020	Anisotropic eikonal solution using physics-informed neural networks	https://doi.org/10.1190/segam2020-3423159.1	Waheed	X			SEG	SEG Technical Program	Traveltime tomography	Eikonal Eq.			Supervised	PINN (Physics-informed NN)		Synthetic	Synthetic		Velocity model	
2020	Wavefield reconstruction inversion via machine learned functions	https://doi.org/10.1190/segam2020-3427351.1	Song	X			SEG	SEG Technical Program	Helmholtz equation (Wavefield solution)				Supervised	PINN (Physics-informed NN)		Synthetic	Synthetic		Velocity model	MSE
2020	Joint 2D inversion of AMT and seismic traveltime data with deep learning constraint	https://doi.org/10.1190/segam2020-3426298.1	Guo	X	X		SEG	SEG Technical Program	Traveltime tomography	Joint Inversion			Supervised	SRCNN (Deep residual CNN)		Synthetic	Synthetic		Velocity model	
2020	The near-surface velocity reversal and its detection via unsupervised machine learning	https://doi.org/10.1190/geo2019-0025.1	Sun	X			SEG	Geophysics	Traveltime tomography	Shingling (velocity reversal detection)				Fuzzy c-mean		Both	Both		Raw seismic Data (Amplitude)	
2021	A convolutional neural network approach for ghost removal	https://doi.org/10.1190/segam2021-3584059.1	Almuteri	X			SEG	International Meeting for Applied Geoscience & Energy	Source deghosting				Supervised	CNN		Synthetic	Synthetic	Marmousi/Sigsbee	Raw seismic Data (Amplitude)	
2021	Automatic velocity picking from semblances with a new deep-learning regression strategy: Comparison with a classification approach	https://doi.org/10.1190/geo2020-0423.1	Wang	X			SEG	Geophysics	Semblance picking				Supervised	CNN	U-NET	Synthetic	Both	Marmousi II/Hess	Raw seismic Data (CMP)	multiple (MSE, Log loss)
2021	Source deghosting of coarsely sampled common-receiver data using a convolutional neural network	https://doi.org/10.1190/geo2020-0186.1	Vrolijk	X			SEG	Geophysics	Source deghosting				Supervised	CNN		Both	Both		Raw seismic Data (Amplitude)	
2021	Accelerating E&P Decisions by Applying Artificial Intelligence and Big Data Analytics to Unstructured Data	https://doi.org/10.3997/2214-4609.202181002	Maver		X		EAGE	Digital Subsurface Conference in Latin America	Data management	Unstructured data										
2010	Neural-network based multi-azimuth processing	https://doi.org/10.3997/2214-4609.20149948	Huck	X			EAGE	EAGE Annual	Multi-Azimuthal processing				Unsupervised	Multiple (MLP/LVQ (Unsupervised Vector Quantizers))		Synthetic	Real			
2020	Source Deghosting of Coarsely-Sampled Data Using a Machine-Learning Approach	https://doi.org/10.3997/2214-4609.202011488	Vorlijk	X			EAGE	EAGE Annual	Source deghosting				Supervised	CNN		Synthetic	Synthetic	Marmousi		
2020	Wavefield Solutions from Machine Learned Functions that Approximately Satisfy the Wave Equation	https://doi.org/10.3997/2214-4609.202010588	Alkhalifa	X			EAGE	EAGE Annual	Helmholtz equation (Wavefield solution)				Supervised	CNN		Synthetic	Synthetic		Velocity model	
2020	Deep-Learning Inversion to Efficiently Handle Big-Data Assimilation: Application to Seismic History Matching	https://doi.org/10.3997/2214-4609.202035158	Xiao	X			EAGE	ECMOR XVII	Seismic history matching				Supervised	CNN						
2020	Deep Learning for Anisotropy Parameters Estimation in Oil/Gas Fractured Reservoirs	https://doi.org/10.3997/2214-4609.202010395	Sabinin	X		X	EAGE	EAGE Annual	Anisotropy				Supervised	CNN		Synthetic	Synthetic		Raw seismic Data (Amplitude)	MSE
2020	Physics-Constrained Deep Learning for Solving the Eikonal Equation	https://doi.org/10.3997/2214-4609.202011764	Grubas	X		X	EAGE	EAGE Annual	Traveltime tomography	Eikonal Eq.			Supervised	PINN (Physics-informed NN)		Synthetic	Synthetic		Velocity model	
2020	Time-Lapse Cross-Equalization by Deep Learning	https://doi.org/10.3997/2214-4609.202011720	Alali				EAGE	EAGE Annual	Time-Lapse Cross-Equalization											
2020	Building and Understanding Deep Neural Networks Components for Seismic Processing: Lessons Learned	https://doi.org/10.3997/2214-4609.202011287	Chambefort		X		EAGE	EAGE annual	Muting											
2020	Understanding How a Deep Neural Network Architecture Choice Can Be Related to a Seismic Processing Task	https://doi.org/10.3997/2214-4609.202032076	Messud				EAGE	First EAGE Digitalization Conference and Exhibition	Muting											
2020	Data-To-Data and Gradient-To-Gradient Translations in Geophysics Using Deep Neural Networks	https://doi.org/10.3997/2214-4609.202011334	Yao				EAGE	EAGE Annual	Acoustic-elastic data translation		Hydrophone-Geophone data translationü									
2020	Slope Estimation by Convolutional Neural Networks	https://doi.org/10.3997/2214-4609.202010260	Zu				EAGE	EAGE Annual	local slope											
2020	Seismic Registration Using Convolutional Neural Networks	https://doi.org/10.3997/2214-4609.202011141	Dhara				EAGE	EAGE Annual	Seismic data registration											
2019	ROCK PHYSICS AT-SCALE, ENABLED BY BIG DATA ANALYTICS & MACHINE LEARNING	https://doi.org/10.3997/2214-4609.201903407	Mannini		X		EAGE	APGCE	Data management	Cloud management										
2019	Before Machine Learning: handling seismic data with Python and segyio	https://doi.org/10.3997/2214-4609.201901973	Kvalsvik		X		EAGE	EAGE Annual	Data management	Segy preparation for ML										
2019	The Use of the Neural Network for Traveltimes Approximation for Inhomogeneous Velocity Models	https://doi.org/10.3997/2214-4609.201901193	Grubas	X			EAGE	EAGE Annual	Traveltime tomography	Traveltime interpolation						Synthetic	Synthetic			
2019	Neural Network Travel-Time Tomography	https://doi.org/10.3997/2214-4609.201901966	Earp	X			EAGE	EAGE Annual	Traveltime tomography	Inversion			Supervised	Mixture density network		Synthetic	Synthetic		First breaks	
2018	Machine Learning to Support Technical Document Indexing, a Case Study on Seismic Acquisition Reports	https://doi.org/10.3997/2214-4609.201801219	Blondelle		X		EAGE	PESGB	Data management	Data indexing			Supervised			Real	Real		Raw seismic Data (Passive)	
2018	Machine Learning To Support Technical Document Indexing, How To Measure The Accuracy?	https://doi.org/10.3997/2214-4609.201803012	Blondelle		X		EAGE	PESGB	Data management	Data indexing			Supervised			Real	Real			
2018	Unsupervised Machine Learning: K-means Clustering Velocity Semblance Auto-Picking	https://doi.org/10.3997/2214-4609.201800919	Wei	X	X		EAGE	EAGE Annual	Semblance picking				Unsupervised	Kmeans		Real	Real		Velocity Sembelance	
2018	Deep Learning Based 3D Velocity Field Nonlinear Multiple Regression	https://doi.org/10.3997/2214-4609.201800922	Wei				EAGE	EAGE Annual	Semblance picking											
2017	Machine Learning can extract the information needed for modelling and data analysing from unstructured documents	https://doi.org/10.3997/2214-4609.201701654	Blondelle		X		EAGE	EAGE Annual	Data management	Data indexing			Supervised							
2021	Derive residual statics solution using a high-resolution neural network	https://doi.org/10.1190/segam2021-3583898.1	Duan	X			SEG	International Meeting for Applied Geoscience & Energy	statics				Supervised			Both			Raw seismic Data (Amplitude)	L1 norm
2018	Machine Learning and Wave Equation Inversion of Skeletonized Data	https://doi.org/10.3997/2214-4609.201801882	Schuster	X			EAGE	EAGE workshop	Wave equation inversion											