TABLE 1. Structure similarity of the Noisy versions to the Original image A_1 and A_2, A_3. Noises 1 through 5 are Gaussian noise; 6 thorough 8 are salt and pepper noise; 9 is Poisson noise; 10 through 12 are speckle noise; 13 and 14 are mixture noise (having multiple sources); and 15 through 17 are localvar noise (intensity-dependent Gaussian noise). All the noises were generated in MATLAB and are labeled in the increasing order of noise levels for the same noise type. More details of the experiment data is provided in Section 5.1.

	Haar WNPSSIM	MS-SSIM	VIF	IW-SSIM	Db4 WNPSSIM	Sym4 WNPSSIM	Jpeg9.7 WNPSSIM	Bior6.8 WNPSSIM
$N_{1,1}$	0.933	0.976	0.640	0.977	0.930	0.932	0.913	0.946
$N_{2,1}$	0.931	0.945	0.482	0.947	0.925	0.931	0.908	0.942
$N_{3,1}$	0.917	0.882	0.328	0.886	0.914	0.915	0.891	0.925
$N_{4,1}$	0.886	0.814	0.246	0.821	0.889	0.886	0.870	0.898
$N_{5,1}$	0.736	0.538	0.096	0.559	0.740	0.736	0.724	0.748
$N_{6,1}$	0.961	0.992	0.865	0.990	0.950	0.960	0.924	0.961
$N_{7,1}$	0.954	0.962	0.547	0.957	0.957	0.957	0.921	0.958
$N_{8,1}$	0.950	0.938	0.436	0.931	0.954	0.954	0.918	0.955
$N_{9,1}$	0.933	0.949	0.504	0.950	0.933	0.936	0.911	0.945
$N_{10,1}$	0.936	0.955	0.555	0.954	0.938	0.936	0.914	0.946
$N_{11,1}$	0.928	0.934	0.469	0.933	0.936	0.928	0.910	0.944
$N_{12,1}$	0.882	0.726	0.182	0.731	0.878	0.879	0.857	0.894
$N_{13,1}$	0.789	0.630	0.145	0.669	0.818	0.815	0.822	0.855
$N_{14,1}$	0.766	0.523	0.108	0.575	0.796	0.791	0.798	0.831
$N_{15,1}$	0.887	0.816	0.246	0.822	0.891	0.886	0.869	0.897
$N_{16,1}$	0.860	0.762	0.200	0.770	0.859	0.860	0.841	0.873
$N_{17,1}$	0.795	0.643	0.134	0.659	0.794	0.793	0.775	0.807
$N_{1,2}$	0.928	0.988	0.671	0.988	0.933	0.927	0.908	0.938
$N_{2,2}$	0.919	0.971	0.516	0.972	0.926	0.914	0.901	0.929
$N_{3,2}$	0.901	0.931	0.363	0.937	0.906	0.905	0.882	0.914
$N_{4,2}$	0.875	0.886	0.275	0.895	0.876	0.875	0.857	0.889
$N_{5,2}$	0.725	0.650	0.109	0.682	0.732	0.727	0.715	0.737
$N_{6,2}$	0.961	0.996	0.879	0.995	0.950	0.960	0.924	0.961
$N_{7,2}$	0.954	0.978	0.582	0.976	0.955	0.957	0.921	0.958
$N_{8,2}$	0.951	0.960	0.460	0.959	0.954	0.954	0.918	0.955
$N_{9,2}$	0.933	0.973	0.534	0.974	0.933	0.933	0.911	0.945
$N_{10,2}$	0.930	0.975	0.566	0.975	0.936	0.935	0.912	0.948
$N_{11,2}$	0.929	0.962	0.486	0.962	0.935	0.934	0.913	0.943
$N_{12,2}$	0.878	0.803	0.199	0.818	0.877	0.880	0.858	0.888
$N_{13,2}$	0.776	0.729	0.166	0.778	0.795	0.792	0.800	0.831
$N_{14,2}$	0.754	0.628	0.124	0.697	0.772	0.770	0.777	0.808
$N_{15,2}$	0.875	0.886	0.275	0.896	0.875	0.879	0.861	0.885
$N_{16,2}$	0.843	0.844	0.227	0.857	0.849	0.850	0.829	0.857
$N_{17,2}$	0.782	0.747	0.158	0.770	0.784	0.782	0.766	0.790
$N_{1,3}$	0.925	0.978	0.657	0.980	0.924	0.921	0.908	0.943
$N_{2,3}$	0.919	0.949	0.500	0.954	0.922	0.924	0.904	0.934
$N_{3,3}$	0.911	0.891	0.349	0.901	0.910	0.909	0.889	0.919
$N_{4,3}$	0.883	0.827	0.266	0.842	0.885	0.882	0.866	0.898
$N_{5,3}$	0.750	0.568	0.110	0.605	0.747	0.753	0.735	0.766
$N_{6,3}$	0.961	0.992	0.876	0.991	0.948	0.960	0.924	0.961
$N_{7,3}$	0.956	0.964	0.573	0.962	0.956	0.958	0.921	0.958
$N_{8,3}$	0.951	0.940	0.446	0.938	0.954	0.954	0.918	0.955
$N_{9,3}$	0.934	0.947	0.508	0.952	0.932	0.930	0.910	0.943
$N_{10,3}$	0.931	0.950	0.531	0.954	0.933	0.938	0.915	0.950
$N_{11,3}$	0.936	0.925	0.451	0.930	0.933	0.932	0.912	0.947
$N_{12,3}$	0.875	0.705	0.183	0.726	0.874	0.877	0.855	0.887
$N_{13,3}$	0.766	0.664	0.165	0.709	0.783	0.781	0.792	0.825
$N_{14,3}$	0.745	0.565	0.126	0.624	0.762	0.762	0.771	0.804
$N_{15,3}$	0.878	0.827	0.264	0.842	0.881	0.880	0.865	0.897
$N_{16,3}$	0.851	0.778	0.217	0.797	0.848	0.847	0.834	0.867
$N_{17,3}$	0.804	0.676	0.156	0.703	0.801	0.798	0.791	0.819

TABLE 2. Structure similarity of the Noisy versions to the Original image A_4 and A_5, A_6. Noises 1 through 5 are Gaussian noise; 6 thorough 8 are salt and pepper noise; 9 is Poisson noise; 10 through 12 are speckle noise; 13 and 14 are mixture noise (having multiple sources); and 15 through 17 are localvar noise (intensity-dependent Gaussian noise). All the noises were generated in MATLAB and are labeled in the increasing order of noise levels for the same noise type. More details of the experiment data is provided in Section 5.1.

	Haar WNPSSIM	MS-SSIM	VIF	IW-SSIM	Db4 WNPSSIM	Sym4 WNPSSIM	Jpeg9.7 WNPSSIM	Bior6.8 WNPSSIM
$N_{1,4}$	0.926	0.954	0.591	0.949	0.927	0.933	0.912	0.944
$N_{2,4}$	0.922	0.899	0.428	0.886	0.926	0.921	0.903	0.937
$N_{3,4}$	0.902	0.799	0.286	0.775	0.905	0.903	0.883	0.917
$N_{4,4}$	0.866	0.710	0.212	0.675	0.875	0.865	0.853	0.882
$N_{5,4}$	0.713	0.425	0.101	0.398	0.708	0.710	0.694	0.721
$N_{6,4}$	0.960	0.988	0.859	0.980	0.952	0.960	0.923	0.961
$N_{7,4}$	0.950	0.935	0.522	0.906	0.956	0.957	0.921	0.958
$N_{8,4}$	0.951	0.887	0.379	0.848	0.954	0.954	0.918	0.955
$N_{9,4}$	0.932	0.922	0.452	0.906	0.938	0.932	0.911	0.945
$N_{10,4}$	0.938	0.939	0.509	0.918	0.935	0.933	0.915	0.944
$N_{11,4}$	0.928	0.912	0.423	0.882	0.935	0.929	0.910	0.946
$N_{12,4}$	0.881	0.669	0.166	0.620	0.880	0.881	0.858	0.890
$N_{13,4}$	0.800	0.491	0.136	0.487	0.816	0.813	0.817	0.846
$N_{14,4}$	0.773	0.389	0.108	0.395	0.790	0.788	0.793	0.820
$N_{15,4}$	0.872	0.711	0.216	0.680	0.866	0.872	0.852	0.882
$N_{16,4}$	0.836	0.644	0.181	0.608	0.831	0.837	0.814	0.844
$N_{17,4}$	0.752	0.524	0.131	0.488	0.759	0.755	0.740	0.770
$N_{1,5}$	0.938	0.974	0.659	0.978	0.934	0.936	0.911	0.945
$N_{2,5}$	0.928	0.941	0.505	0.949	0.924	0.929	0.904	0.937
$N_{3,5}$	0.909	0.881	0.358	0.894	0.906	0.906	0.883	0.918
$N_{4,5}$	0.877	0.824	0.277	0.841	0.877	0.878	0.858	0.890
$N_{5,5}$	0.732	0.602	0.119	0.635	0.731	0.733	0.723	0.744
$N_{6,5}$	0.961	0.994	0.880	0.993	0.953	0.960	0.924	0.961
$N_{7,5}$	0.955	0.963	0.594	0.961	0.954	0.958	0.921	0.958
$N_{8,5}$	0.953	0.930	0.450	0.930	0.954	0.954	0.918	0.955
$N_{9,5}$	0.931	0.935	0.533	0.943	0.933	0.937	0.912	0.944
$N_{10,5}$	0.933	0.929	0.570	0.935	0.939	0.936	0.913	0.947
$N_{11,5}$	0.934	0.903	0.491	0.911	0.932	0.936	0.912	0.946
$N_{12,5}$	0.870	0.719	0.211	0.743	0.881	0.869	0.860	0.890
$N_{13,5}$	0.730	0.668	0.172	0.715	0.743	0.749	0.776	0.797
$N_{14,5}$	0.708	0.579	0.132	0.639	0.725	0.729	0.755	0.776
$N_{15,5}$	0.880	0.822	0.275	0.840	0.878	0.880	0.858	0.891
$N_{16,5}$	0.846	0.788	0.231	0.806	0.844	0.839	0.828	0.858
$N_{17,5}$	0.785	0.711	0.166	0.734	0.784	0.786	0.766	0.795
$N_{1,6}$	0.935	0.976	0.650	0.976	0.936	0.933	0.914	0.949
$N_{2,6}$	0.930	0.945	0.490	0.944	0.930	0.931	0.908	0.942
$N_{3,6}$	0.909	0.886	0.342	0.883	0.910	0.907	0.889	0.921
$N_{4,6}$	0.886	0.827	0.260	0.822	0.888	0.887	0.868	0.899
$N_{5,6}$	0.735	0.580	0.107	0.579	0.744	0.738	0.726	0.805
$N_{6,6}$	0.961	0.993	0.870	0.990	0.948	0.960	0.924	0.961
$N_{7,6}$	0.953	0.964	0.575	0.955	0.956	0.957	0.920	0.958
$N_{8,6}$	0.952	0.938	0.432	0.926	0.954	0.954	0.917	0.955
$N_{9,6}$	0.934	0.947	0.507	0.945	0.930	0.934	0.914	0.944
$N_{10,6}$	0.933	0.951	0.537	0.948	0.937	0.939	0.916	0.950
$N_{11,6}$	0.935	0.928	0.452	0.923	0.934	0.931	0.910	0.945
$N_{12,6}$	0.877	0.728	0.180	0.715	0.880	0.876	0.857	0.888
$N_{13,6}$	0.743	0.664	0.158	0.681	0.768	0.764	0.792	0.818
$N_{14,6}$	0.722	0.567	0.120	0.594	0.748	0.742	0.770	0.795
$N_{15,6}$	0.888	0.826	0.257	0.820	0.886	0.886	0.866	0.895
$N_{16,6}$	0.857	0.782	0.215	0.775	0.857	0.858	0.840	0.868
$N_{17,6}$	0.795	0.678	0.148	0.672	0.792	0.791	0.776	0.803

TABLE 3. Structure similarity of the Noisy versions to the Original image A_7 and A_8, A_9. Noises 1 through 5 are Gaussian noise; 6 thorough 8 are salt and pepper noise; 9 is Poisson noise; 10 through 12 are speckle noise; 13 and 14 are mixture noise (having multiple sources); and 15 through 17 are localvar noise (intensity-dependent Gaussian noise). All the noises were generated in MATLAB and are labeled in the increasing order of noise levels for the same noise type. More details of the experiment data is provided in Section 5.1.

	Haar WNPSSIM	MS-SSIM	VIF	IW-SSIM	Db4 WNPSSIM	Sym4 WNPSSIM	Jpeg9.7 WNPSSIM	Bior6.8 WNPSSIM
$N_{1,7}$	0.934	0.966	0.626	0.967	0.932	0.934	0.908	0.946
$N_{2,7}$	0.921	0.925	0.462	0.926	0.923	0.919	0.901	0.936
$N_{3,7}$	0.899	0.849	0.317	0.850	0.896	0.899	0.878	0.911
$N_{4,7}$	0.870	0.778	0.240	0.779	0.865	0.867	0.849	0.880
$N_{5,7}$	0.710	0.528	0.100	0.537	0.708	0.709	0.697	0.723
$N_{6,7}$	0.961	0.992	0.856	0.988	0.954	0.960	0.923	0.961
$N_{7,7}$	0.953	0.951	0.534	0.941	0.957	0.957	0.920	0.958
$N_{8,7}$	0.952	0.918	0.414	0.906	0.954	0.954	0.918	0.955
$N_{9,7}$	0.936	0.929	0.508	0.928	0.934	0.933	0.910	0.945
$N_{10,7}$	0.934	0.937	0.566	0.935	0.935	0.934	0.912	0.948
$N_{11,7}$	0.933	0.909	0.482	0.904	0.934	0.929	0.909	0.946
$N_{12,7}$	0.882	0.704	0.206	0.696	0.881	0.882	0.859	0.890
$N_{13,7}$	0.722	0.601	0.146	0.632	0.734	0.730	0.759	0.784
$N_{14,7}$	0.700	0.505	0.112	0.549	0.715	0.709	0.736	0.761
$N_{15,7}$	0.868	0.778	0.237	0.779	0.870	0.862	0.848	0.878
$N_{16,7}$	0.835	0.724	0.192	0.727	0.834	0.834	0.815	0.845
$N_{17,7}$	0.767	0.613	0.131	0.620	0.765	0.762	0.751	0.780
$N_{1,8}$	0.894	0.966	0.629	0.966	0.904	0.903	0.885	0.918
$N_{2,8}$	0.889	0.927	0.472	0.926	0.884	0.882	0.867	0.899
$N_{3,8}$	0.847	0.854	0.324	0.850	0.849	0.847	0.835	0.865
$N_{4,8}$	0.807	0.785	0.248	0.780	0.814	0.812	0.800	0.832
$N_{5,8}$	0.636	0.542	0.106	0.539	0.644	0.634	0.638	0.663
$N_{6,8}$	0.960	0.991	0.863	0.988	0.952	0.960	0.924	0.961
$N_{7,8}$	0.951	0.956	0.552	0.944	0.954	0.957	0.921	0.958
$N_{8,8}$	0.952	0.919	0.405	0.904	0.953	0.954	0.917	0.955
$N_{9,8}$	0.929	0.937	0.517	0.933	0.926	0.927	0.906	0.941
$N_{10,8}$	0.943	0.945	0.561	0.938	0.938	0.941	0.914	0.948
$N_{11,8}$	0.929	0.919	0.480	0.910	0.933	0.936	0.909	0.943
$N_{12,8}$	0.876	0.728	0.207	0.707	0.879	0.877	0.855	0.889
$N_{13,8}$	0.673	0.612	0.155	0.629	0.678	0.679	0.700	0.729
$N_{14,8}$	0.655	0.521	0.121	0.547	0.658	0.660	0.679	0.710
$N_{15,8}$	0.791	0.778	0.236	0.773	0.788	0.790	0.788	0.822
$N_{16,8}$	0.741	0.710	0.183	0.705	0.739	0.736	0.735	0.771
$N_{17,8}$	0.686	0.625	0.140	0.620	0.684	0.677	0.680	0.712
$N_{1,9}$	0.931	0.975	0.644	0.977	0.938	0.936	0.910	0.944
$N_{2,9}$	0.927	0.944	0.481	0.949	0.929	0.925	0.904	0.938
$N_{3,9}$	0.908	0.881	0.331	0.890	0.912	0.913	0.890	0.923
$N_{4,9}$	0.886	0.818	0.251	0.833	0.882	0.882	0.864	0.897
$N_{5,9}$	0.734	0.566	0.101	0.592	0.734	0.734	0.720	0.747
$N_{6,9}$	0.961	0.992	0.857	0.991	0.949	0.960	0.924	0.961
$N_{7,9}$	0.955	0.963	0.556	0.960	0.955	0.957	0.921	0.958
$N_{8,9}$	0.953	0.937	0.435	0.935	0.953	0.954	0.918	0.955
$N_{9,9}$	0.931	0.948	0.500	0.951	0.933	0.933	0.913	0.945
$N_{10,9}$	0.939	0.954	0.536	0.954	0.934	0.937	0.914	0.946
$N_{11,9}$	0.927	0.931	0.451	0.932	0.937	0.933	0.908	0.945
$N_{12,9}$	0.876	0.728	0.177	0.740	0.880	0.873	0.857	0.890
$N_{13,9}$	0.763	0.650	0.152	0.693	0.787	0.786	0.807	0.842
$N_{14,9}$	0.740	0.551	0.115	0.607	0.766	0.764	0.785	0.819
$N_{15,9}$	0.888	0.818	0.249	0.831	0.887	0.887	0.863	0.895
$N_{16,9}$	0.851	0.770	0.205	0.786	0.853	0.848	0.831	0.865
$N_{17,9}$	0.789	0.666	0.142	0.687	0.786	0.787	0.772	0.802