

Set-1

Qualitative Results:

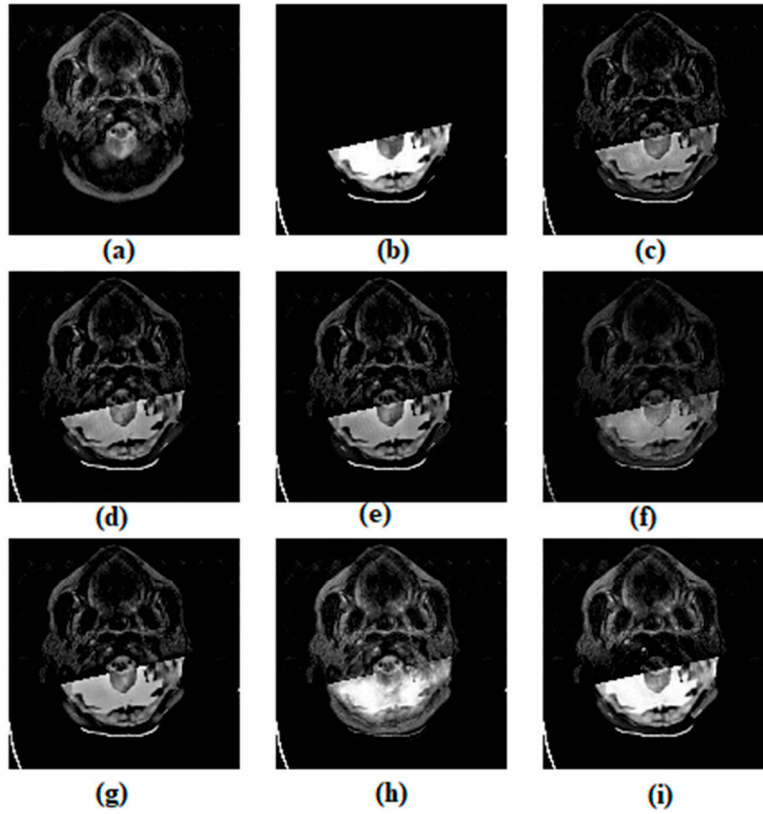


Figure S1 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S1. Quantitative analysis of various fusion methods for MRI-CT image pairs image pairs (Set-1)

Metrics\Methods	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	56.2842	58.3557	58.2284	35.8497	57.5471	61.3513	63.2695
MI	2.6832	2.3258	2.4148	2.9294	2.6481	3.3425	2.9435
VIFF	0.2778	0.2504	0.2328	0.2524	0.2952	0.3051	0.343
$Q_P^{AB/F}$	0.6439	0.6093	0.6279	0.2778	0.6548	0.5867	0.6788
SSIM	0.6249	0.3932	0.495	0.5164	0.5672	0.6975	0.6182
RMSE	0.0319	0.0317	0.0318	0.0312	0.032	0.0145	0.0204
AG	5.6663	5.8262	5.8275	3.7763	5.7212	6.1815	6.2962

PSNR	18.089 3	17.990 8	18.0981	17.698 9	18.4951	16.183 5	18.3887
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Set-2

Qualitative Results:

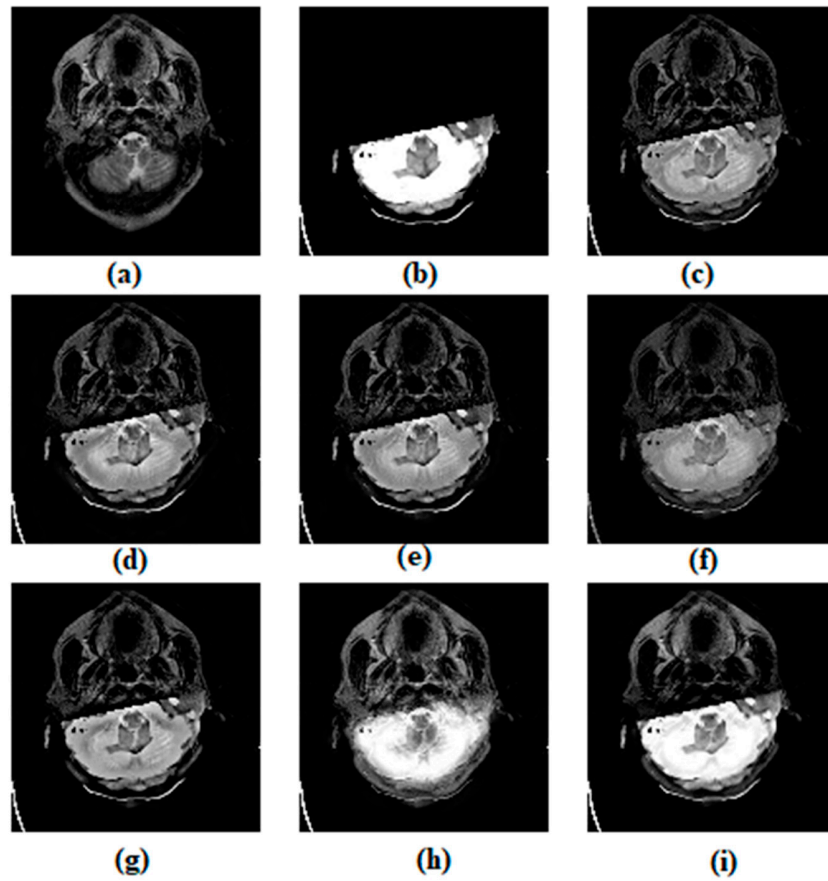


Figure S2 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S2. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-2).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	60.4616	63.3194	62.2319	43.9701	61.7147	63.6631	64.755
MI	2.9756	2.6293	2.6902	3.1771	2.8151	3.3717	2.9704
VIFF	0.3196	0.2935	0.2715	0.3012	0.2782	0.3226	0.3728
$Q_P^{AB/F}$	0.6435	0.5874	0.6047	0.3737	0.6432	0.55	0.6473

SSIM	0.604	0.318	0.4461	0.5549	0.5446	0.6256	0.594
RMSE	0.0299	0.0298	0.0299	0.0289	0.03	0.0174	0.0239
AG	6.1179	6.3515	6.2771	4.8272	6.1705	6.4151	5.9265
PSNR	16.1831	16.1112	16.2326	15.9758	16.4273	15.6406	18.2992

Set-3

Qualitative Results:

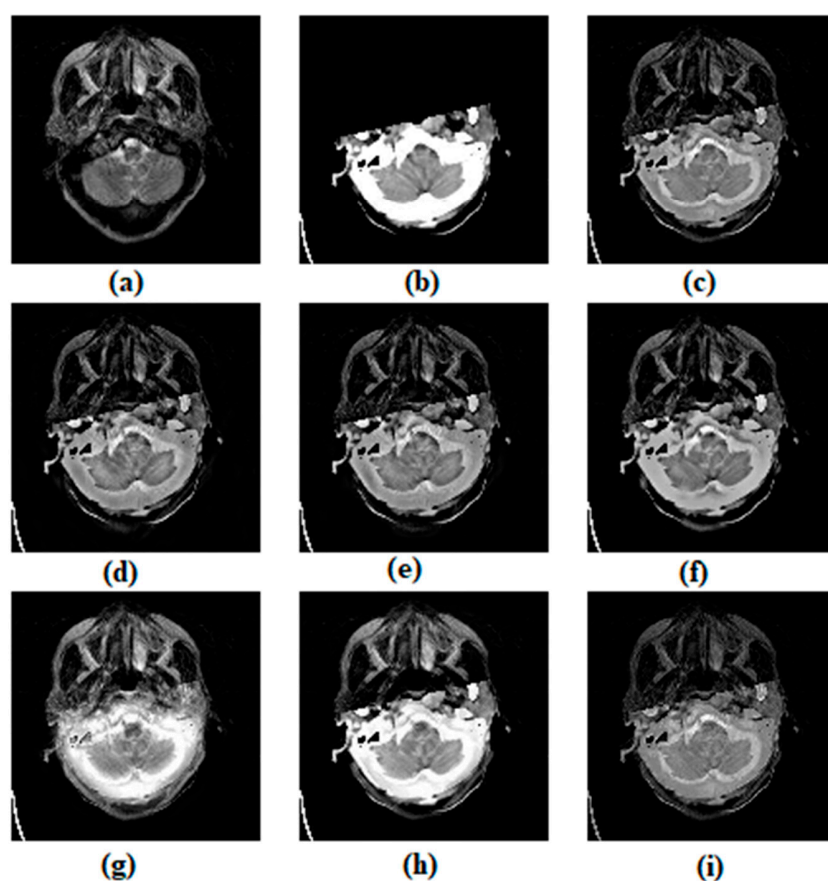


Figure S3 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S3. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-3).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	68.3278	71.3639	70.9627	56.9793	70.1726	70.567	73.1176
MI	3.2084	2.8125	2.9043	3.3929	3.0746	3.5197	3.3535
VIFF	0.2734	0.2508	0.2259	0.29	0.2571	0.2963	0.3465
$Q_p^{AB/F}$	0.5982	0.5359	0.5579	0.4349	0.6057	0.488	0.5959
SSIM	0.5659	0.3074	0.4089	0.5518	0.5047	0.6105	0.5822
RMSE	0.0285	0.0285	0.0288	0.0277	0.0286	0.0204	0.0204
AG	6.9026	7.1609	7.1443	6.093	6.9973	7.1528	7.304
PSNR	15.989	15.9552	16.1199	15.6553	16.3009	14.7776	17.0023

Set-4

Qualitative Results:

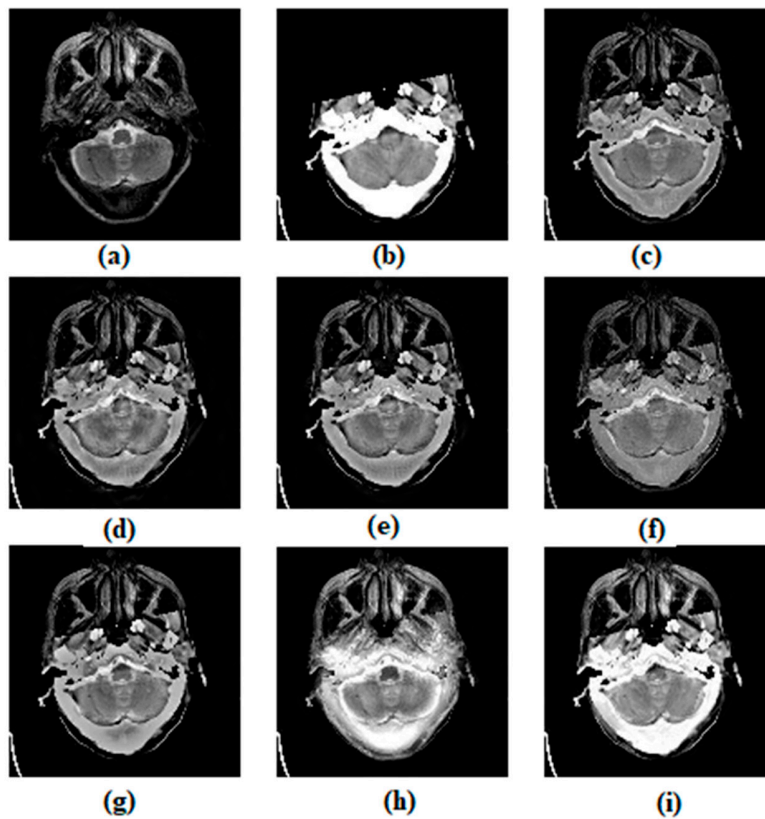


Figure S4 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S4. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-4).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	74.9936	81.2307	79.2072	65.8973	77.6089	77.4143	85.8038
MI	3.3259	2.9178	2.9851	3.4635	3.1893	3.4308	3.6212
VIFF	0.2762	0.2618	0.2471	0.2991	0.2594	0.279	0.3349
$Q_p^{AB/F}$	0.5779	0.5287	0.5508	0.4437	0.5933	0.4512	0.5888
SSIM	0.5513	0.282	0.4278	0.5655	0.5997	0.578	0.5618
RMSE	0.031	0.0304	0.0309	0.0307	0.031	0.0241	0.0168
AG	7.5941	8.1573	7.9882	7.087	7.765	7.8385	8.5067
PSNR	15.3526	15.2879	15.56	14.8721	15.7447	14.2176	16.7652

Set-5

Qualitative Results:

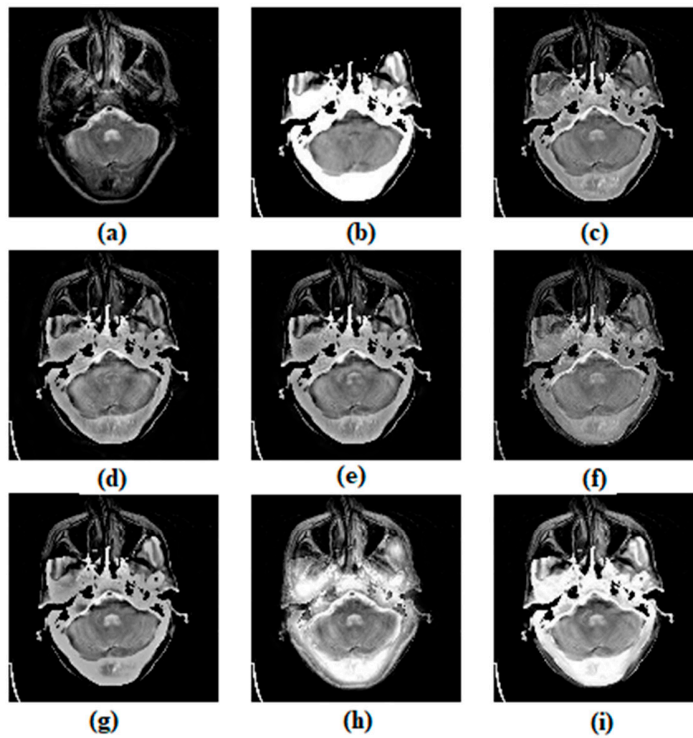


Figure S5 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S5. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-5).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	81.5778	86.6207	85.1826	71.696	83.3975	80.1446	89.067
MI	3.48	3.1366	3.1924	3.6202	3.3922	3.507	3.7856
VIFF	0.2949	0.2627	0.2581	0.3125	0.2874	0.2664	0.3975
$Q_P^{AB/F}$	0.557	0.5151	0.5371	0.4288	0.575	0.3944	0.5552
SSIM	0.4906	0.3223	0.4105	0.5014	0.5374	0.5288	0.4913
RMSE	0.032	0.0317	0.032	0.032	0.0324	0.0256	0.0201
AG	8.277	8.7127	8.5992	7.7476	8.3486	8.1937	8.9349
PSNR	15.3131	15.6593	15.8248	14.4995	16.2079	14.0726	17.9813

Set-6

Qualitative Results:

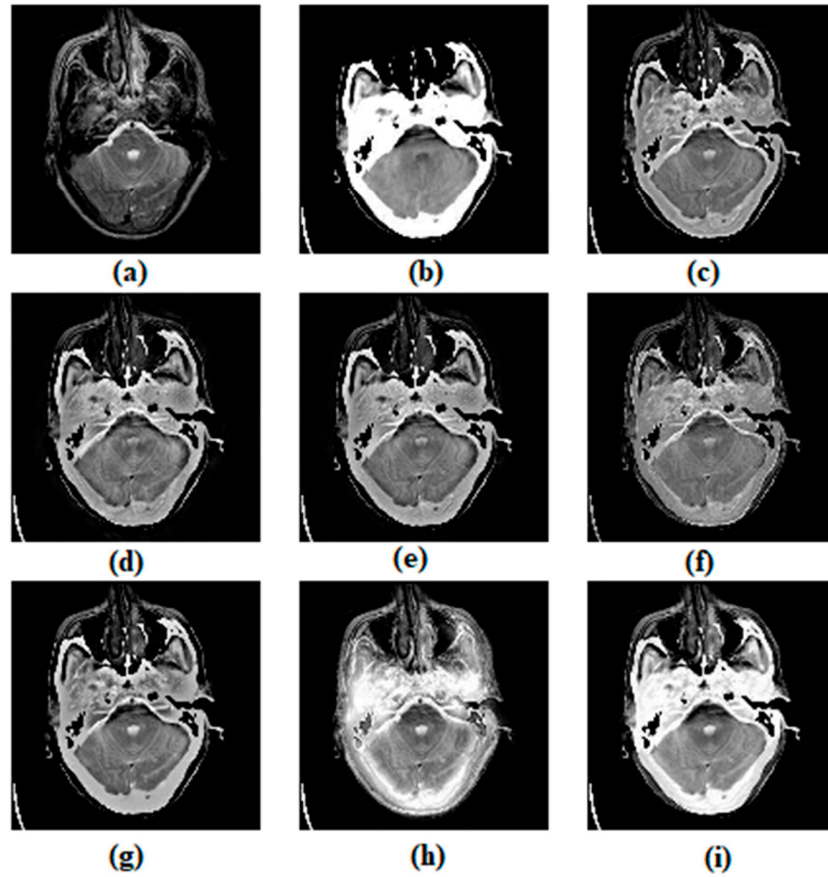


Figure S6 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S6. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-6).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	86.461	90.9278	88.3094	75.3805	88.7043	80.9913	90.112
MI	3.6101	3.2676	3.3458	3.7389	3.4263	3.494	3.8284
VIFF	0.3092	0.2701	0.2621	0.3316	0.3071	0.2855	0.4246
$Q_P^{AB/F}$	0.5676	0.4991	0.5212	0.4308	0.5746	0.3856	0.5507
SSIM	0.583	0.3458	0.501	0.5583	0.6228	0.528	0.5863
RMSE	0.0333	0.0333	0.0335	0.0335	0.0337	0.0263	0.0213
AG	8.7128	9.1433	8.9194	8.1945	8.8494	8.2911	8.9632
PSNR	15.3237	15.7526	15.9634	14.3396	15.7314	13.9945	19.1723

Set-7

Qualitative Results:

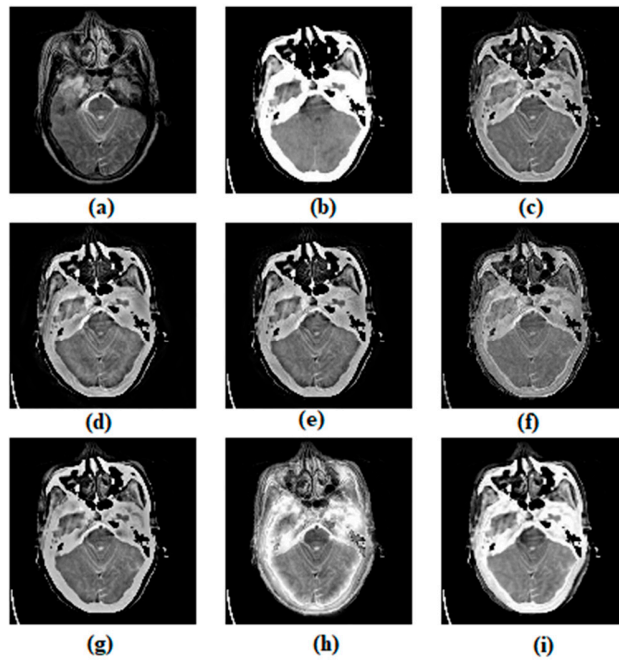


Figure S7 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S7. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-7).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
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EI	85.184	91.4179	88.8534	77.183	87.2195	81.9079	90.3901
MI	3.948	3.5486	3.6561	3.490	3.8117	3.7038	4.0792
VIFF	0.3215	0.2908	0.2801	0.3445	0.3197	0.2675	0.4065
$Q_P^{AB/F}$	0.5355	0.4782	0.5005	0.4275	0.5363	0.3733	0.5382
SSIM	0.5638	0.3767	0.4999	0.5481	0.6298	0.5209	0.6971
RMSE	0.0347	0.0341	0.0346	0.0345	0.035	0.0275	0.0209
AG	8.561	9.1405	8.9336	8.332	8.6749	8.3684	9.0081
PSNR	16.328	16.7494	17.1661	13.285	17.3933	13.9769	21.3423

Set-8

Qualitative Results:

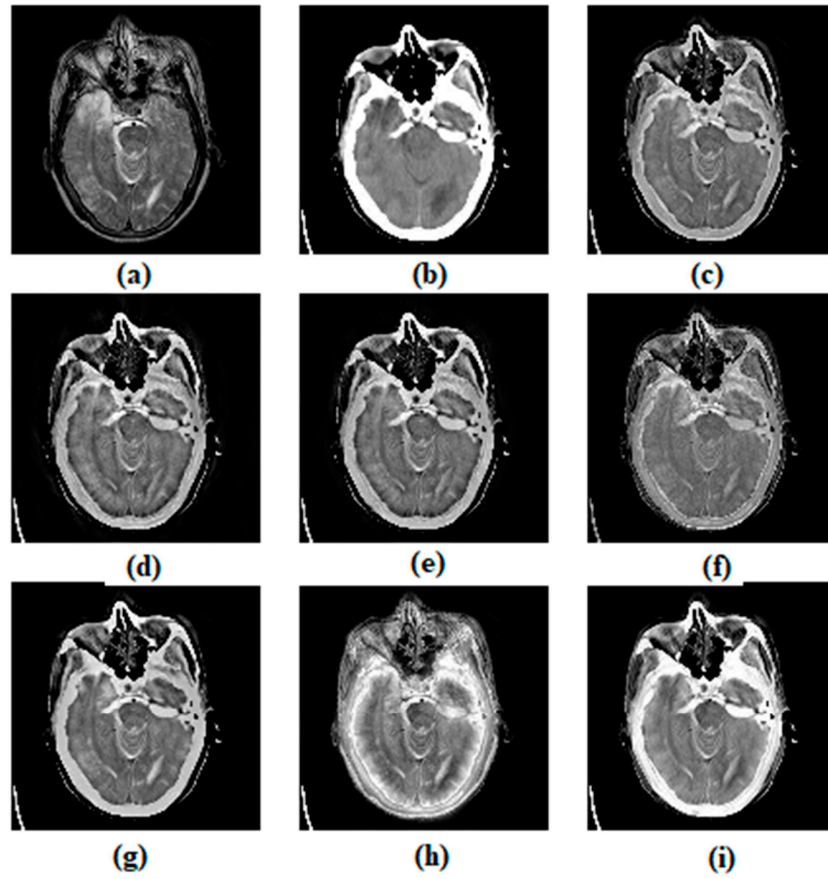


Figure S8 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S8. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-8).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	77.7079	87.0281	83.6396	72.7341	81.0891	79.5838	86.6228
MI	4.0686	3.691	3.8014	4.0656	4.066	3.8275	4.148
VIFF	0.3118	0.2848	0.2737	0.3331	0.3135	0.2658	0.3988
$Q_P^{AB/F}$	0.5022	0.4539	0.4735	0.415	0.5159	0.3915	0.4904
SSIM	0.5855	0.3628	0.5163	0.5881	0.6125	0.5764	0.587
RMSE	0.0336	0.0328	0.0331	0.0331	0.0335	0.0275	0.0218
AG	7.8143	8.6748	8.3788	7.8651	8.0243	8.0568	8.0559
PSNR	17.1647	17.7603	18.2315	15.9133	18.9643	14.285	21.1691

Set-9

Qualitative Results:

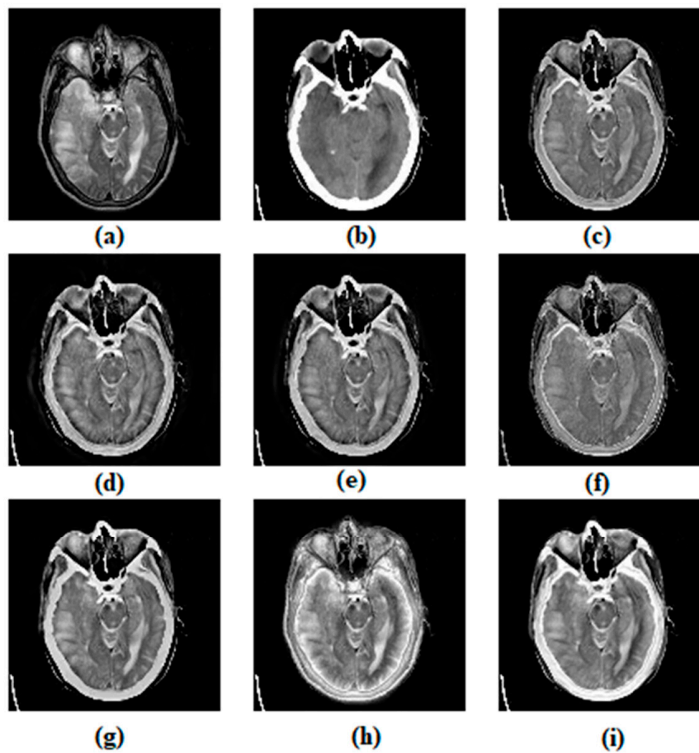


Figure S9 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S9. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-9).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	72.2669	82.7381	78.4802	66.8959	75.2837	77.6608	81.9194
MI	4.1219	3.7285	3.8579	4.0649	4.1925	3.9887	4.2275
VIFF	0.3099	0.2794	0.2725	0.3184	0.3274	0.2431	0.4012
$Q_P^{AB/F}$	0.4959	0.4367	0.4586	0.4034	0.5038	0.4174	0.4907
SSIM	0.569	0.2959	0.4392	0.5832	0.5391	0.6052	0.5516
RMSE	0.0295	0.0294	0.0297	0.0287	0.0294	0.0251	0.0243
AG	7.2062	8.1852	7.7901	7.187	7.407	7.7243	7.2886
PSNR	17.6769	18.1106	18.6802	16.3893	19.0209	14.4343	19.4182

Set-10

Qualitative Results:

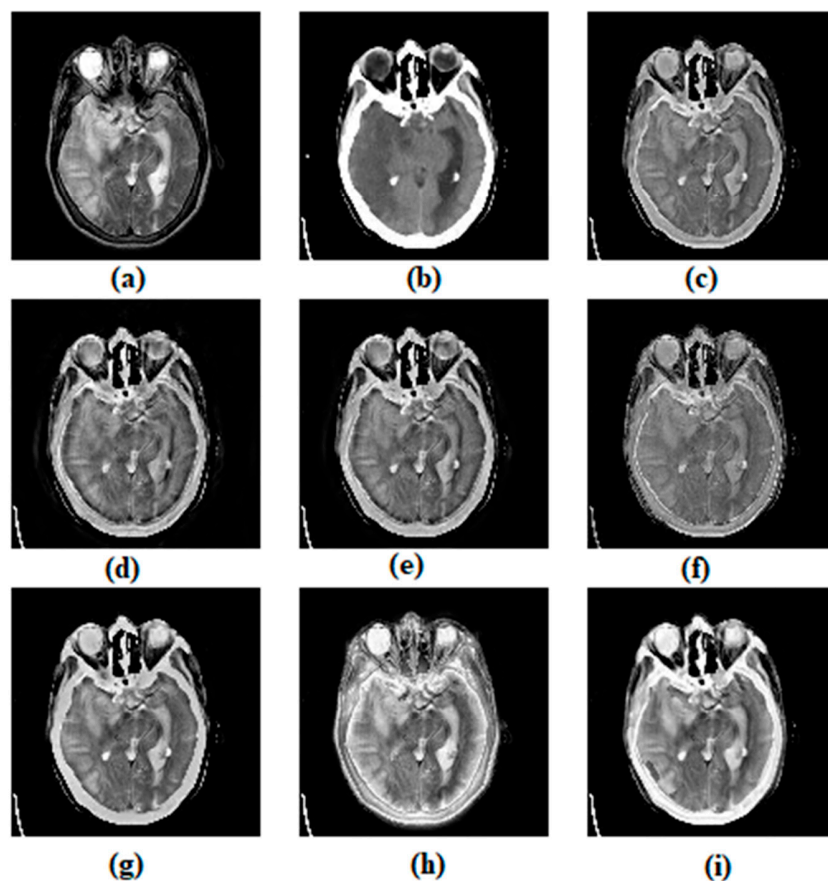


Figure S10 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S10. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-10).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	71.4805	83.5677	78.688	67.069	74.6706	79.3392	84.3464
MI	4.224	3.8695	3.9902	4.1637	4.3246	4.0892	4.3009
VIFF	0.2826	0.2622	0.2542	0.2932	0.3048	0.2337	0.3631
$Q_P^{AB/F}$	0.484	0.4227	0.4464	0.3951	0.4905	0.4166	0.4947
SSIM	0.5841	0.2944	0.4562	0.61	0.5786	0.5965	0.6085
RMSE	0.0302	0.0299	0.0303	0.0294	0.0303	0.0253	0.0232
AG	7.1308	8.2809	7.8089	7.2549	7.3313	7.904	7.3617
PSNR	16.8079	17.2214	17.737	15.8127	17.7433	13.9559	17.3893

Set-11

Qualitative Results:

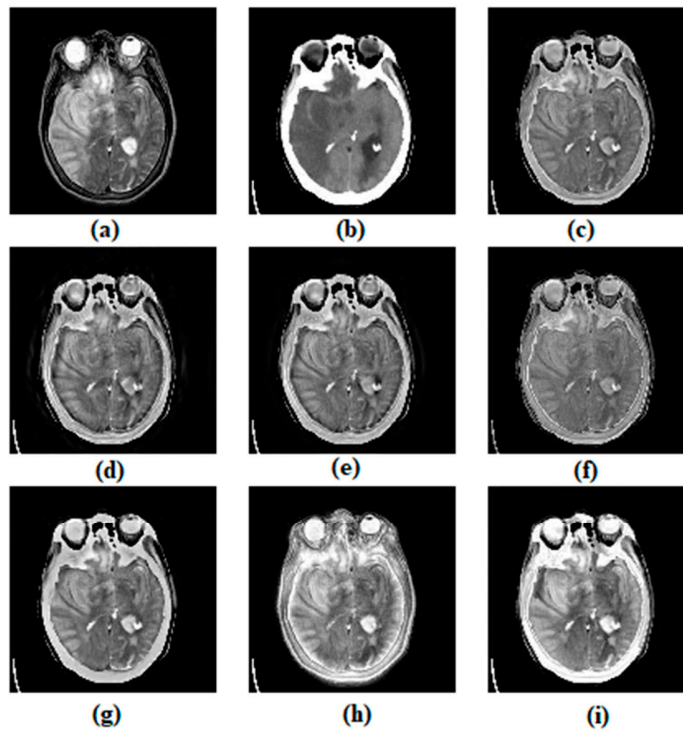


Figure S11 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S11. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-11).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	67.0269	79.9448	75.0863	64.1693	70.4353	75.3184	80.0877
MI	4.2798	3.9046	4.0306	4.2275	4.3462	4.1166	4.3392
VIFF	0.2727	0.2548	0.2496	0.2863	0.2976	0.241	0.3567
$Q_p^{AB/F}$	0.4728	0.4218	0.4356	0.3924	0.4816	0.42	0.4804
SSIM	0.5931	0.2769	0.4139	0.3012	0.5378	0.6007	0.5999
RMSE	0.0294	0.0295	0.0298	0.0286	0.0293	0.0244	0.021
AG	6.6622	7.8871	7.4212	6.8124	6.8773	7.4713	7.9801
PSNR	16.8577	17.1716	17.7201	15.8049	17.8928	13.9817	17.7945

Set-12

Qualitative Results:

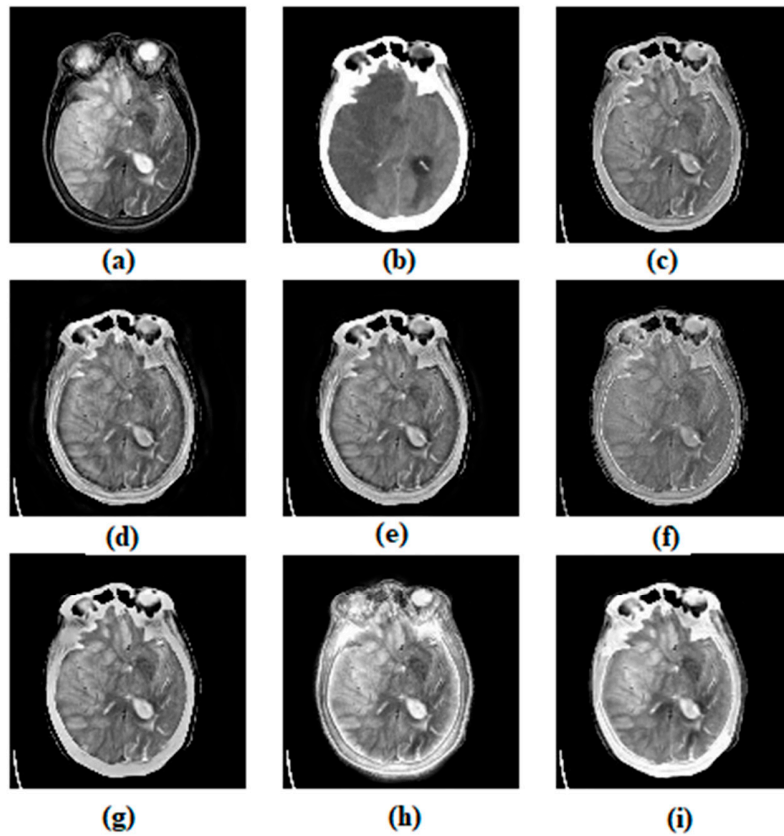


Figure S12 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S12. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-12).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	63.3066	75.1589	70.2961	58.8965	64.9005	71.3852	74.1073
MI	4.221	3.9235	4.0232	4.2152	4.2863	4.1673	4.4576
VIFF	0.3133	0.3006	0.3036	0.3178	0.3378	0.2595	0.4129
$Q_P^{AB/F}$	0.4853	0.4417	0.4522	0.3916	0.4855	0.4165	0.4871
SSIM	0.633	0.3088	0.4627	0.6538	0.6017	0.5889	0.6411
RMSE	0.029	0.0293	0.0295	0.0284	0.0294	0.0244	0.0211
AG	6.3146	7.4159	6.9621	6.3127	6.371	7.0742	6.6677
PSNR	16.9081	17.274	17.6524	15.8891	18.083	13.696	18.0546

Set 13

Qualitative Results:

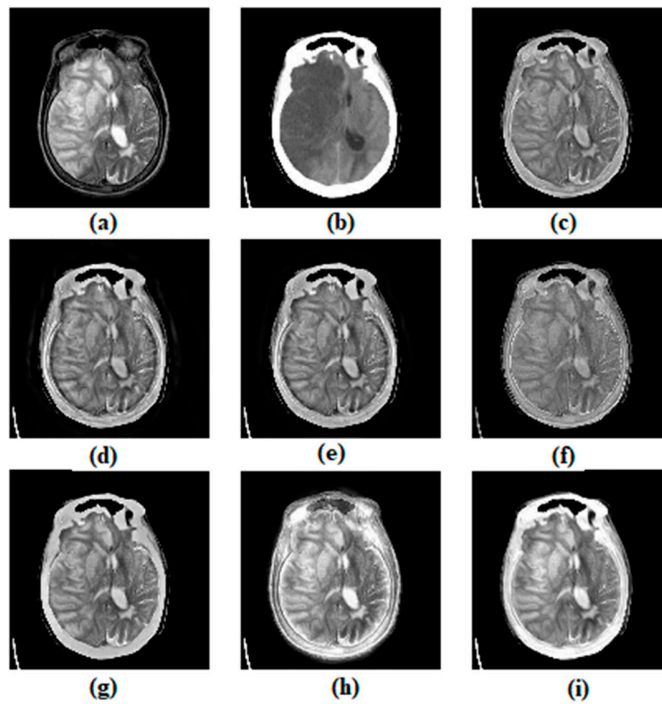


Figure S13 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S13. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-13).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	60.3544	72.2775	67.7116	55.9661	61.5929	71.658	72.6793
MI	4.1673	3.899	3.9942	4.1417	4.3262	4.2127	4.5437
VIFF	0.383	0.3831	0.388	0.3619	0.4281	0.3137	0.5096
$Q_P^{AB/F}$	0.4916	0.4503	0.4586	0.3973	0.4963	0.4442	0.4818
SSIM	0.6361	0.3324	0.463	0.6418	0.6167	0.5513	0.6755
RMSE	0.0283	0.0289	0.0289	0.0274	0.0287	0.0239	0.0209
AG	6	7.1053	6.6841	5.99	6.0253	7.0685	6.9367
PSNR	16.7489	16.9593	17.255	15.921	18.0212	13.5916	17.4659

Set-14

Qualitative Results:

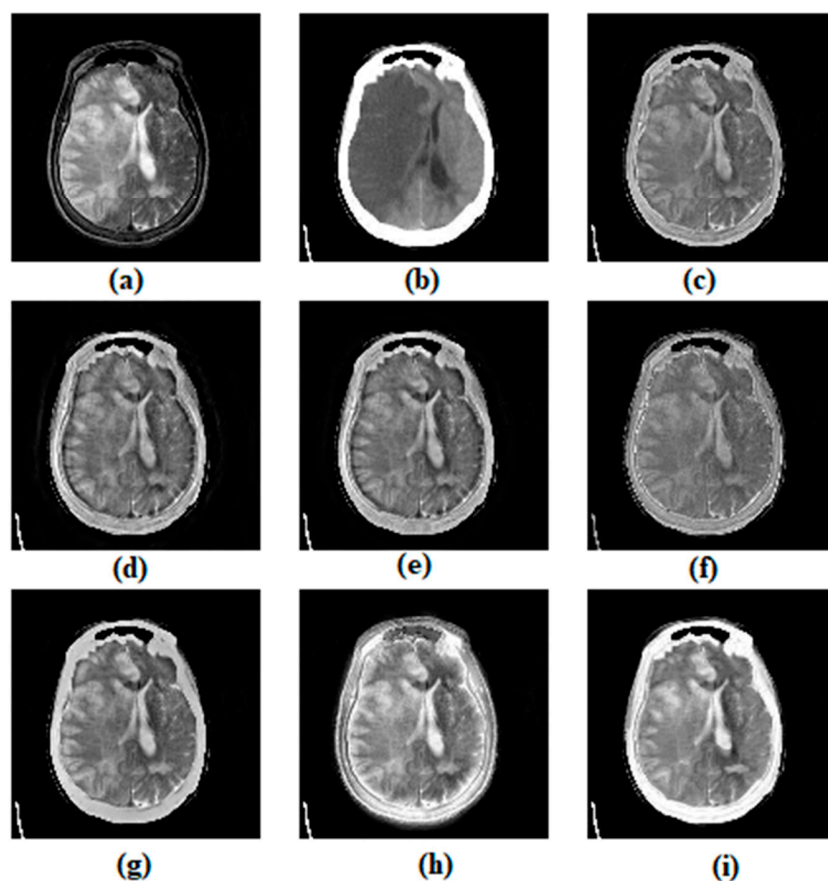


Figure S14 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S14. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-14).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	56.2257	66.9353	63.0619	53.2579	56.2579	67.6827	65.0256
MI	4.3223	3.9103	4.0403	4.3141	4.3643	4.1696	4.519
VIFF	0.3849	0.3856	0.3887	0.3718	0.4442	0.3542	0.5314
$Q_p^{AB/F}$	0.4747	0.4337	0.4452	0.3932	0.4685	0.4335	0.49
SSIM	0.5891	0.3416	0.4601	0.5723	0.5281	0.5497	0.5835
RMSE	0.0291	0.0292	0.0295	0.0285	0.0294	0.0231	0.0198
AG	5.6045	6.5908	6.2317	5.6618	5.506	6.6806	6.4695
PSNR	16.8812	17.0379	17.3586	16.0857	18.253	14.0891	18.069

Set 15

Qualitative Results:

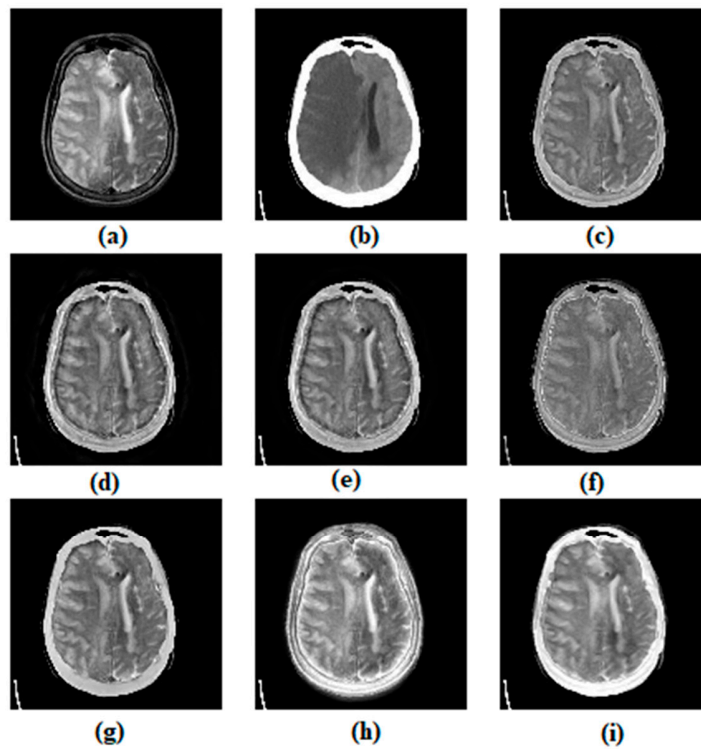


Figure S15 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S15. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-15).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	51.347	63.8778	58.3551	49.7323	51.8998	65.4742	65.8021
MI	4.1861	3.8787	3.9959	4.0904	4.2847	4.2144	4.5491
VIFF	0.3569	0.3622	0.3654	0.3484	0.41	0.3403	0.4846
$Q_P^{AB/F}$	0.4652	0.4189	0.4315	0.3801	0.4616	0.4463	0.4782
SSIM	0.6747	0.3382	0.5073	0.417	0.6637	0.5908	0.6941
RMSE	0.0286	0.0293	0.0296	0.0269	0.028	0.0224	0.018
AG	5.0655	6.2317	5.7194	5.197	5.0452	6.3492	6.3267
PSNR	17.3966	17.268	17.6494	16.392	18.6447	14.0968	18.0241

Set 16

Qualitative Results:

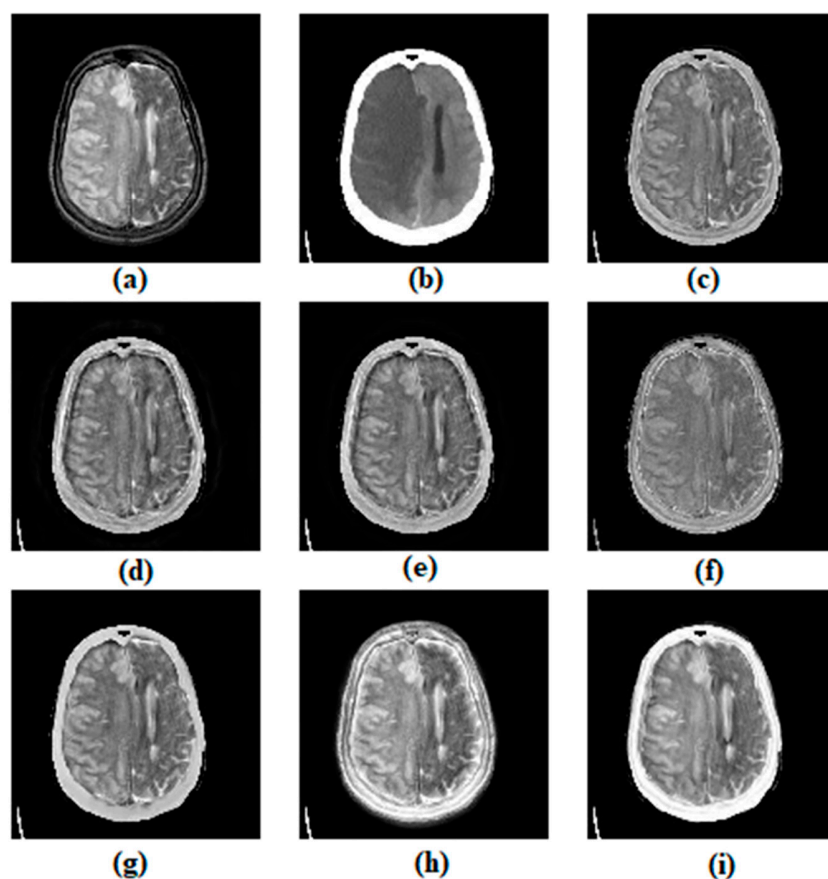


Figure S16 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S16. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-16).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	50.8108	60.7797	56.3032	47.2098	50.7231	63.4633	63.4305
MI	4.1596	3.8698	3.9794	4.0947	4.2586	4.248	4.5075
VIFF	0.3664	0.3685	0.3732	0.3571	0.4215	0.3544	0.4997
$Q_p^{AB/F}$	0.4828	0.4226	0.4396	0.3865	0.4665	0.4487	0.4651
SSIM	0.7182	0.3569	0.5271	0.7158	0.697	0.6139	0.6623
RMSE	0.028	0.0289	0.0294	0.0276	0.0276	0.0224	0.0211
AG	5.0009	5.8984	5.4928	4.9608	4.9154	6.128	5.9004
PSNR	17.3222	17.6025	17.852	16.5241	18.6362	14.3464	18.7951

Set 17

Qualitative Results:

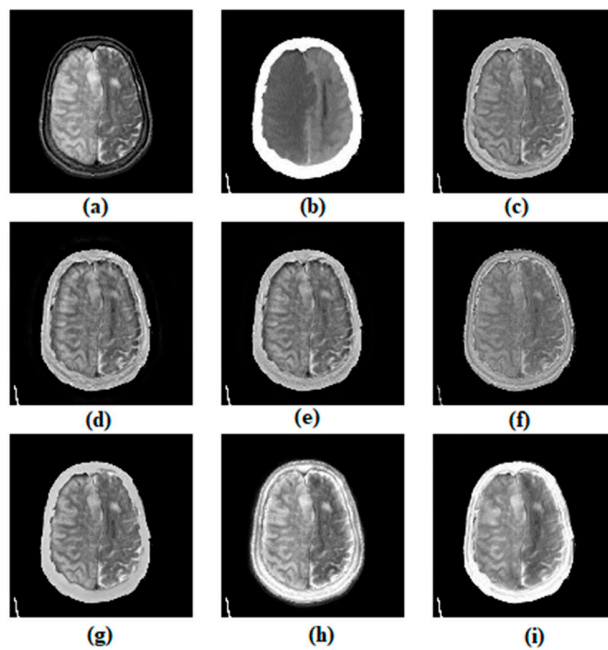


Figure S17 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S17. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-17).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
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EI	46.9902	55.0101	50.5375	43.7345	46.097	57.4709	56.0753
MI	4.0721	3.8249	3.927	4.0723	4.221	4.2423	4.3071
VIFF	0.4157	0.4169	0.4161	0.4011	0.4734	0.4047	0.5652
$Q_P^{AB/F}$	0.5032	0.4453	0.4427	0.4153	0.4659	0.432	0.4963
SSIM	0.7215	0.3482	0.5118	0.7253	0.6978	0.5813	0.7239
RMSE	0.0268	0.0269	0.0272	0.0258	0.0265	0.0226	0.0197
AG	4.5894	5.3332	4.928	4.5221	4.4524	5.5218	5.689
PSNR	17.4978	17.7076	18.0147	16.6851	19.0247	15.4633	19.4565

Set 18

Qualitative Results:

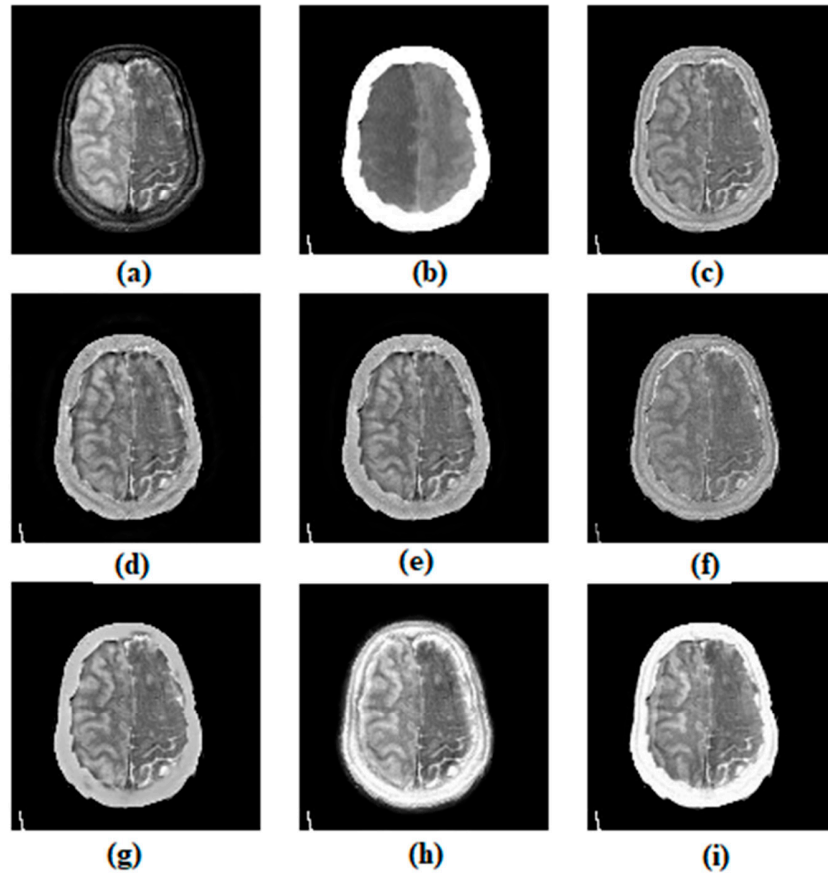


Figure S18 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S18. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-18).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	46.9661	50.9895	48.2714	41.3792	43.9382	52.2594	50.6012
MI	3.968	3.7472	3.8269	3.9772	4.0663	4.2281	4.2207
VIFF	0.4625	0.4532	0.4553	0.4331	0.5161	0.4632	0.6091
$Q_p^{AB/F}$	0.5547	0.4589	0.4658	0.4377	0.483	0.4249	0.5599
SSIM	0.7406	0.3585	0.5268	0.7341	0.7023	0.5634	0.7641
RMSE	0.0277	0.028	0.0281	0.027	0.0276	0.0231	0.0188
AG	4.5819	4.9629	4.7145	4.2475	4.2433	5.0346	4.9241
PSNR	17.2595	17.4106	17.7112	16.6737	18.8651	16.9005	21.6782

Set 19

Qualitative Results:

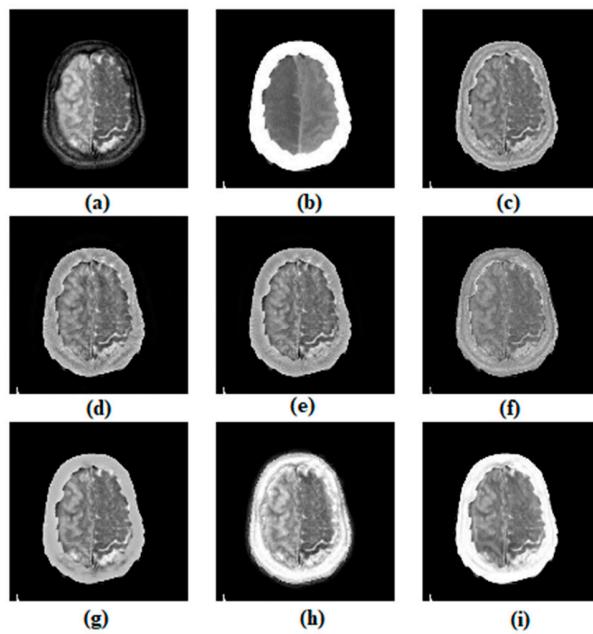


Figure S19 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S19. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-19).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	41.8844	44.5302	42.9182	35.7511	39.2105	44.8426	40.5683

MI	3.8663	3.6562	3.7345	3.9277	3.9606	4.162	4.0931
VIFF	0.4902	0.4774	0.4761	0.4505	0.5376	0.5121	0.6551
$Q_P^{AB/F}$	0.5637	0.4644	0.4806	0.4346	0.499	0.4016	0.5675
SSIM	0.7493	0.3495	0.5385	0.7334	0.7032	0.5337	0.7602
RMSE	0.0287	0.0286	0.0289	0.0281	0.0287	0.0226	0.0182
AG	4.0844	4.3247	4.1935	3.6625	3.7854	4.3368	4.8548
PSNR	16.7619	16.7788	16.9792	16.3013	18.1522	18.3057	23.9398

Set 20

Qualitative Results:

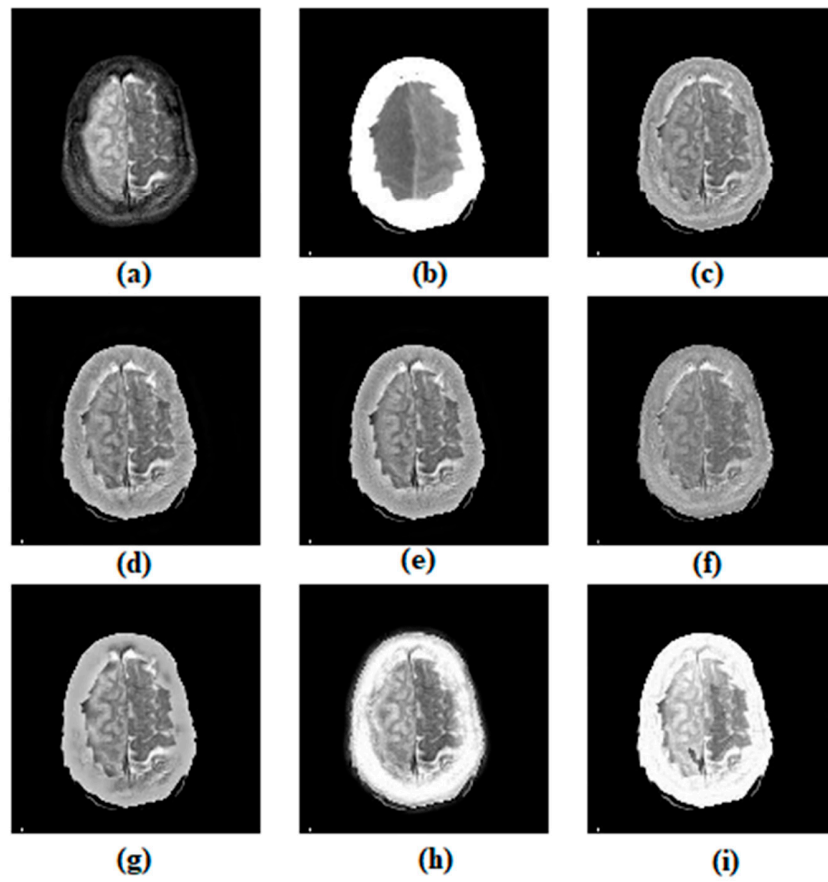


Figure S20 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S20. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-20).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	40.2869	42.7289	41.61	33.7094	38.0134	40.8352	39.8888
MI	3.6189	3.4463	3.4919	3.7	3.5678	3.8949	3.7529
VIFF	0.5225	0.5158	0.5178	0.4817	0.5574	0.5516	0.7003
$Q_p^{AB/F}$	0.5877	0.5107	0.5252	0.4499	0.5367	0.4118	0.5922
SSIM	0.7613	0.3841	0.5796	0.7505	0.7143	0.5336	0.7692
RMSE	0.0289	0.0289	0.0291	0.0286	0.0289	0.0219	0.0134
AG	3.9694	4.1899	4.1025	3.4792	3.6948	4.034	4.2538
PSNR	16.5067	16.4668	16.6105	16.158	17.3056	19.9832	19.749

Set-21:

Qualitative Results:

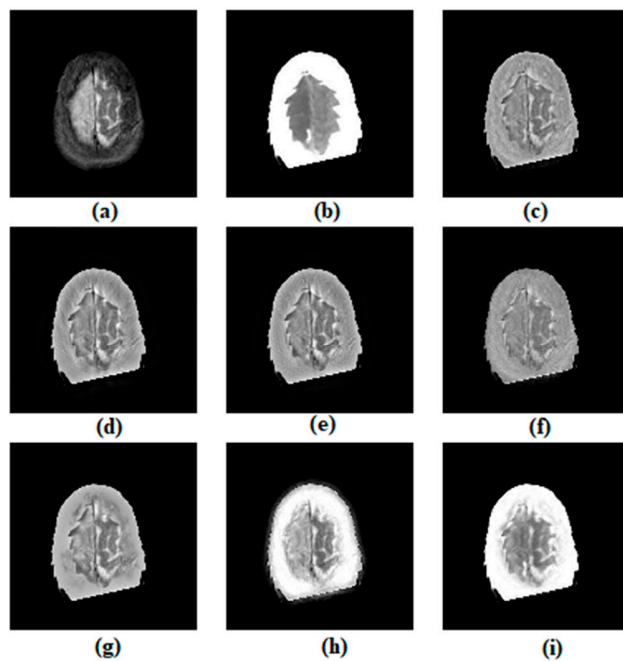


Figure S21 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S21. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-21).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
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EI	30.7689	33.2918	32.7771	25.9329	29.3327	31.8295	29.324
MI	3.2092	3.0091	3.0427	3.2625	3.0578	3.4172	3.3492
VIFF	0.5294	0.5247	0.529	0.4863	0.5684	0.5632	0.7251
$Q_P^{AB/F}$	0.5668	0.4982	0.5167	0.4347	0.5182	0.3976	0.5609
SSIM	0.7718	0.3932	0.592	0.7651	0.758	0.5493	0.7491
RMSE	0.0278	0.0277	0.0278	0.0275	0.0276	0.0198	0.0157
AG	3.0369	3.2457	3.2143	2.6867	2.8434	3.1407	3.07993
PSNR	16.5904	16.5325	16.6093	16.1786	17.2145	21.385	26.7971

Set 22

Qualitative Results:

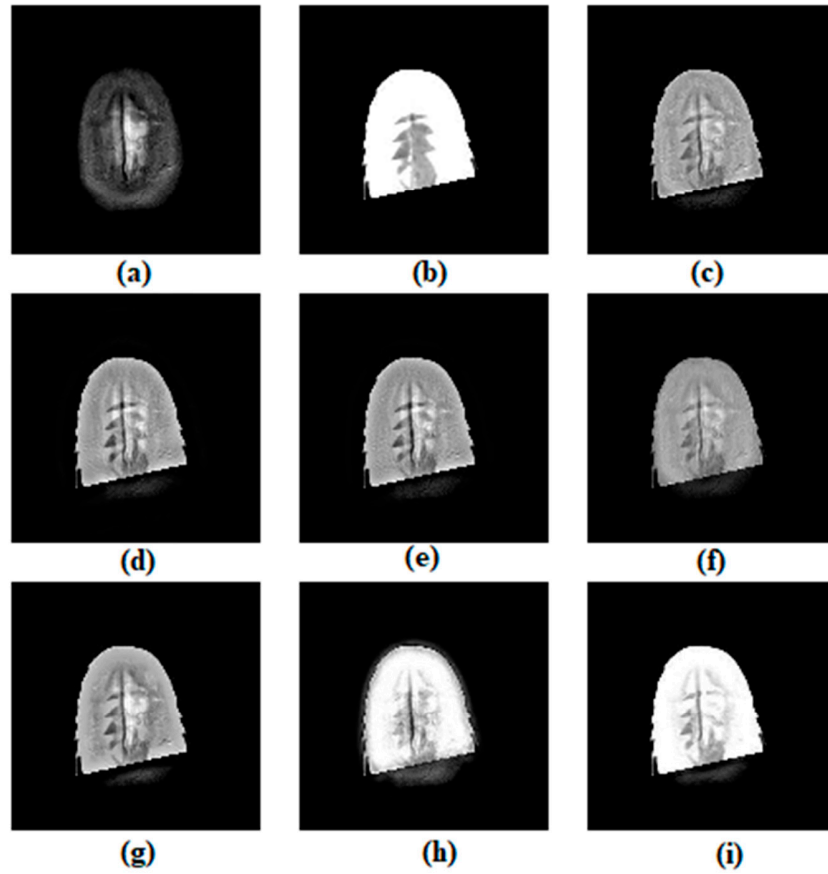


Figure S22 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S22. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-22).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	24.5366	26.9305	26.3521	17.594	24.3594	24.8056	23.761
MI	2.7081	2.5402	2.5691	2.812	2.6135	2.7206	2.5729
VIFF	0.5657	0.5609	0.5666	0.4842	0.607	0.5853	0.7798
$Q_p^{AB/F}$	0.5915	0.5147	0.538	0.318	0.5792	0.434	0.5806
SSIM	0.817	0.4477	0.6579	0.8048	0.7926	0.639	0.8293
RMSE	0.0255	0.0255	0.0254	0.0254	0.0254	0.017	0.0121
AG	2.4237	2.629	2.5865	1.7947	2.363	2.4529	2.7203
PSNR	17.0982	17.1329	17.0664	16.6585	17.261	22.5953	26.5235

Set-23

Qualitative Results:

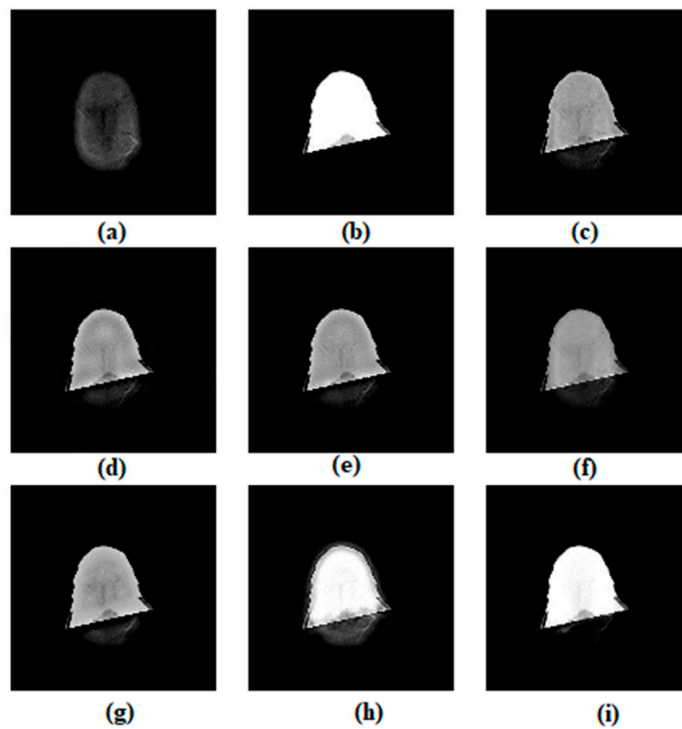


Figure S23 Visual Quality analysis of various fusion algorithms for MRI-CT (a) MRI image, (b) CT image, (c) ASR, (d) CVT, (e) DTCWT, (f) MSVD, (g) CSMCA, (h) NSST, (i) Proposed method

Quantitative Results:

Table S23. Quantitative analysis of various fusion methods for MRI-CT image pairs (set-23).

Metrics\Method	ASR	CVT	DTCWT	MSVD	CSMCA	NSST	Proposed Method
EI	14.1507	15.1794	14.7927	9.9025	13.4509	15.634	14.624
MI	1.9049	1.7319	1.7702	2.0272	1.8277	1.943	1.6781
VIFF	0.6189	0.6135	0.6215	0.5325	0.68	0.6735	0.8636
$Q_p^{AB/F}$	0.6091	0.5627	0.5815	0.318	0.5797	0.5237	0.5969
SSIM	0.8527	0.5163	0.7247	0.8458	0.8412	0.7174	0.8167
RMSE	0.0203	0.0203	0.0203	0.0202	0.0203	0.012	0.0118
AG	1.4305	1.5126	1.4836	1.034	1.3285	1.5723	1.809
PSNR	18.4036	18.4232	18.4847	17.8665	19.0329	24.5132	33.8492