

**Geometrical and statistical features data for “A Fully Automatic CAD-CTC System Based on Curvature Analysis for Standard and Low Dose CT Data”**

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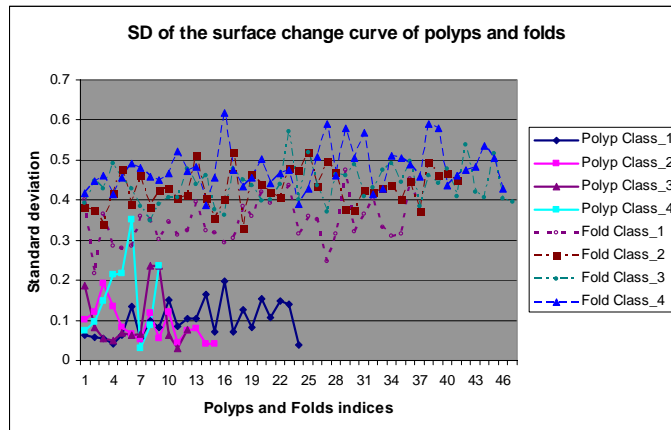


Fig. 13. Standard deviation of the surface variation for different classes of polyps and folds (classes are sorted in ascending order with respect to the size of the polyps/folds).

SD of the surface change (Fig. 13)

Polyp_1	Polyp_2	Polyp_3	Polyp_4	Fold_1	Fold_2	Fold_3	Fold_4
0.064099	0.101476	0.185337	0.371462	0.450003	0.492439	0.388644	0.215515
0.057438	0.193191	0.376974	0.331165	0.466549	0.371463	0.462385	0.363997
0.058332	0.081956	0.08156	0.344465	0.521216	0.451699	0.381196	0.285153
0.054645	0.067239	0.055497	0.357121	0.472621	0.428213	0.426803	0.279872
0.041251	0.052188	0.048366	0.075465	0.483627	0.384616	0.428733	0.285443
0.062227	0.11785	0.068995	0.095275	0.387489	0.388984	0.402765	0.208425
0.13358	0.055204	0.063448	0.148755	0.456426	0.405249	0.411076	0.359285
0.054506	0.121597	0.064582	0.213936	0.618283	0.406386	0.511768	0.350963
0.099867	0.040777	0.235365	0.215849	0.410443	0.477918	0.403503	0.302851
0.211219	0.045204	0.236794	0.350682	0.475173	0.437845	0.399706	0.248634
0.085201	0.075061	0.355959	0.235955	0.364289	0.460056	0.518125	0.347146
0.104205	0.079365	0.06412		0.432477	0.376103	0.463173	0.312283
0.10374	0.133524	0.030403		0.456022	0.47631	0.439551	0.323799
0.165804		0.086745		0.503071	0.450858	0.419765	0.395783
0.071673		0.075919		0.443252	0.436831	0.407631	0.322651
0.197828				0.467583	0.396949	0.480622	0.317673
0.071366				0.474606	0.401653	0.475243	0.293655
0.125288				0.391144	0.437967	0.519102	0.306045
0.082201				0.427281	0.571143	0.432884	0.384948
0.152907				0.506496	0.400306	0.495861	0.35899
0.107192				0.589429	0.519102	0.468674	0.420627
0.067239				0.461719	0.435942	0.375216	0.39239
0.039678				0.579647	0.371826	0.373483	0.403893
0.040666				0.50412	0.462708	0.419938	0.43627
				0.568419	0.460363	0.42938	0.316745
				0.415057	0.489536	0.436712	0.360855
				0.427531	0.410126	0.401002	0.351815
				0.50962	0.432245	0.447248	0.246731
				0.505785	0.47473	0.370036	0.202587
				0.488524	0.380992	0.493907	0.287942
				0.457799	0.492574	0.460488	0.314847

Class Mean: **0.09384**    **0.089587**    **0.135338**    **0.249103**    **0.4747**    **0.438166**    **0.436923**    **0.32251**

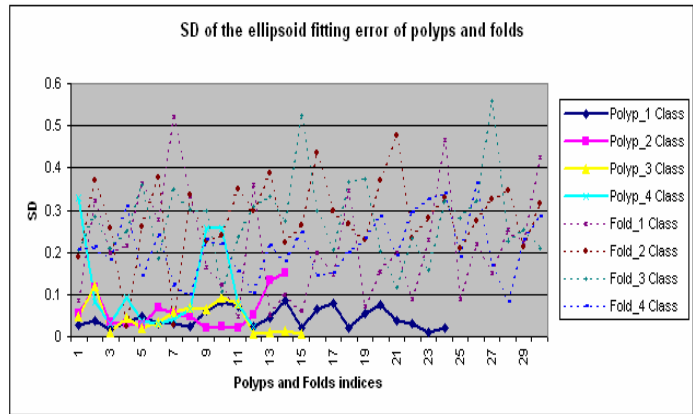


Fig. 14. Standard deviation of the ellipsoid error for different classes of polyps and folds.

SD of the ellipsoid fit error (Fig. 14)

Polyp_1	Polyp_2	Polyp_3	Polyp_4	Fold_1	Fold_2	Fold_3	Fold_4
0.02632	0.053205	0.049417	0.083858	0.048399	0.256232	0.348495	0.212299
0.037538	0.117671	0.118657	0.030592	0.361661	0.024655	0.300985	0.181583
0.016905	0.034241	0.009307	0.093111	0.050619	0.259458	0.298541	0.309923
0.034682	0.031822	0.044976	0.037521	0.098341	0.378637	0.107181	0.14563
0.047803	0.027853	0.021461	0.032133	0.062752	0.028363	0.237191	0.239229
0.029415	0.067442	0.033484	0.040656	0.200135	0.33659	0.30807	0.124536
0.030515	0.054568	0.056639	0.06611	0.147685	0.227933	0.334248	0.098045
0.023821	0.047029	0.068304	0.258742	0.3477	0.238372	0.273009	0.230973
0.063103	0.021694	0.066222	0.257972	0.07277	0.348495	0.525086	0.218988
0.080999	0.024852	0.091651	0.076089	0.153151	0.299838	0.299563	0.153431
0.072045	0.020623	0.079753	0.023177	0.19818	0.388864	0.205099	0.103811
0.024755	0.052376	0.006822		0.090621	0.222407	0.366698	0.215368
0.046201	0.134317	0.008989		0.230346	0.264532	0.372841	0.178943
0.084341		0.012967		0.465405	0.434379	0.200937	0.247473
0.021305		0.008019		0.088906	0.298098	0.115966	0.145397
0.064043				0.219492	0.267887	0.232774	0.149772
0.080554				0.149517	0.230528	0.159105	0.198582
0.020113				0.254389	0.3702	0.322022	0.231675
0.055218				0.221868	0.476505	0.280938	0.285059
0.077123				0.425335	0.231796	0.32215	0.192521
0.038148				0.778306	0.280938	0.558368	0.293968
0.031822				0.059217	0.328881	0.225811	0.326522
0.010576				0.639182	0.208333	0.254985	0.340521
0.022211				0.266938	0.275199	0.209378	0.189838
				0.221724	0.326213	0.462708	0.363053
				0.214687	0.34761	0.252797	0.168116
				0.199272	0.21411	0.375195	0.083413
				0.397661	0.314725	0.345351	0.229138
				0.072828	0.22916	0.240916	0.28378
				0.452709	0.261221	0.108187	0.188427
				0.081658	0.163208	0.461008	0.253465

Class mean: **0.043315** **0.052899** **0.045111** **0.090906** **0.234563** **0.27527** **0.293729** **0.21237**

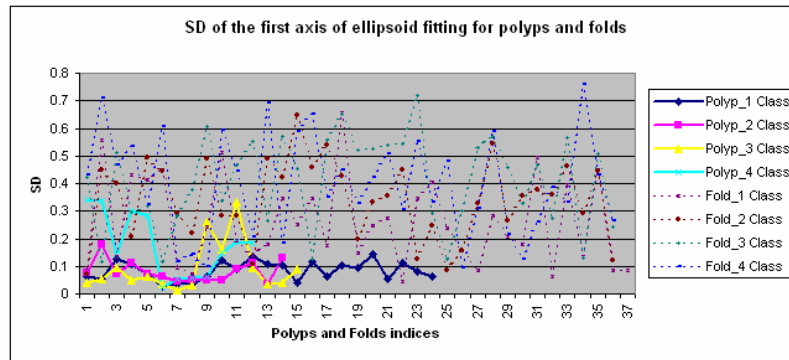


Fig. 15. Standard deviation of the first axis of the fitted ellipsoid for different classes of polyps and folds.

SD of the first axis of the fitted ellipsoid (Fig. 15)

Polyp_1	Polyp_2	Polyp_3	Polyp_4	Fold_1	Fold_2	Fold_3	Fold_4
0.064932	0.075796	0.039022	0.337655	0.192152	0.402032	0.285135	0.710998
0.05358	0.179305	0.055487	0.144912	0.141174	0.204838	0.378311	0.465421
0.127138	0.069823	0.093055	0.301349	0.180592	0.495515	0.608159	0.533121
0.109899	0.111012	0.04727	0.285078	0.345795	0.443518	0.335053	0.325356
0.07221	0.073794	0.061634	0.024399	0.251744	0.291806	0.466295	0.606966
0.025865	0.063997	0.036878	0.054347	0.344292	0.218872	0.553144	0.116771
0.035847	0.046914	0.013338	0.056871	0.174261	0.4887	0.26368	0.145776
0.035565	0.048105	0.033028	0.064495	0.65703	0.283035	0.571074	0.099476
0.060822	0.051216	0.262532	0.14981	0.149454	0.285135	0.452047	0.594595
0.122808	0.050649	0.159756	0.189467	0.245774	0.106366	0.126158	0.446882
0.088993	0.089076	0.332299	0.184697	0.275821	0.490671	0.55728	0.208415
0.132943	0.110672	0.092989		0.043251	0.423911	0.650029	0.690581
0.107363	0.035045	0.037615		0.347706	0.649324	0.522725	0.18616
0.103454		0.041435		0.405181	0.459271	0.525184	0.589554
0.040694		0.09173		0.240381	0.539069	0.537266	0.652143
0.117344				0.157321	0.426557	0.542528	0.352484
0.065058				0.086879	0.199086	0.719027	0.449372
0.103641				0.284254	0.331384	0.292585	0.327981
0.092948				0.205693	0.356436	0.123715	0.421677
0.145983				0.177544	0.447879	0.300457	0.50764
0.052886				0.49231	0.123715	0.530919	0.307088
0.111012				0.061867	0.248986	0.568956	0.551657
0.078693				0.394326	0.086263	0.457396	0.332626
0.061051				0.132675	0.155566	0.326222	0.482091
				0.450279	0.326662	0.469282	0.096353
				0.085392	0.545391	0.276195	0.309148
				0.083395	0.26495	0.56643	0.590736
				0.205574	0.356269	0.128347	0.215941
				0.292318	0.377496	0.507885	0.126567
				0.434332	0.359625	0.241497	0.260824
				0.076776	0.462523	0.242464	0.388216

Class mean:      **0.08378**      **0.077339**      **0.093204**      **0.163007**      **0.245663**      **0.350027**      **0.423401**      **0.390084**

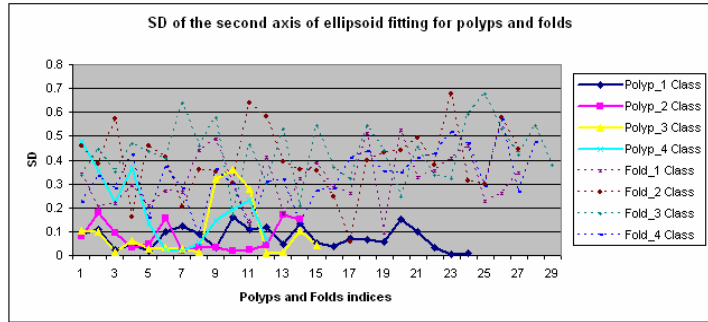


Fig. 16. Standard deviation of the second axis of the fitted ellipsoid for different classes of polyps and folds.

SD of the second axis of the fitted ellipsoid (Fig. 16)

Polyp_1	Polyp_2	Polyp_3	Polyp_4	Fold_1	Fold_2	Fold_3	Fold_4
0.089718	0.080826	0.105251	0.353096	0.134177	0.571954	0.639308	0.330479
0.107457	0.179195	0.101704	0.221194	0.411414	0.162928	0.457281	0.279737
0.024863	0.09282	0.014463	0.370296	0.174591	0.458928	0.577857	0.419587
0.046603	0.0349	0.06281	0.131636	0.320466	0.414004	0.171034	0.157058
0.016736	0.04855	0.027932	0.025628	0.386508	0.201299	0.46405	0.371142
0.0988	0.157968	0.032855	0.018879	0.285441	0.361844	0.30306	0.277421
0.12365	0.017323	0.03026	0.052316	0.260339	0.352467	0.52896	0.076403
0.091572	0.033904	0.015096	0.147902	0.510797	0.303805	0.209995	0.358578
0.034643	0.032997	0.322875	0.19185	0.093891	0.639308	0.545425	0.300104
0.162567	0.01822	0.361083	0.234147	0.523126	0.583596	0.369621	0.10697
0.107769	0.024117	0.280424	0.064753	0.325928	0.39275	0.320662	0.307079
0.118615	0.041056	0.010829		0.352888	0.361872	0.542328	0.315652
0.049674	0.172066	0.013243		0.405326	0.35686	0.441462	0.134873
0.13145		0.102085		0.460266	0.247218	0.246264	0.271284
0.050515		0.041495		0.225627	0.057937	0.45469	0.279891
0.036218				0.258534	0.399449	0.337246	0.407241
0.069773				0.345884	0.43136	0.322256	0.436144
0.064428				0.240114	0.438384	0.593066	0.351564
0.058606				0.399771	0.493861	0.675088	0.343591
0.153133				0.303389	0.380304	0.531513	0.407642
0.097924				0.705116	0.675088	0.420115	0.42467
0.0349				0.244501	0.313582	0.546471	0.514535
0.006855				0.58217	0.299951	0.376776	0.470097
0.009549				0.53431	0.576935	0.35341	0.287403
				0.508279	0.445222	0.345289	0.568191
				0.366683	0.603549	0.421983	0.264416
				0.134917	0.401722	0.380883	0.472499
				0.597507	0.428753	0.578925	0.331961
				0.276174	0.475647	0.285342	0.41644
				0.211655	0.407571	0.347529	0.186742
				0.537939	0.384785	0.660187	0.359679

Class mean:    **0.074418**    **0.071842**    **0.101494**    **0.1647**    **0.358636**    **0.407191**    **0.433809**    **0.32997**

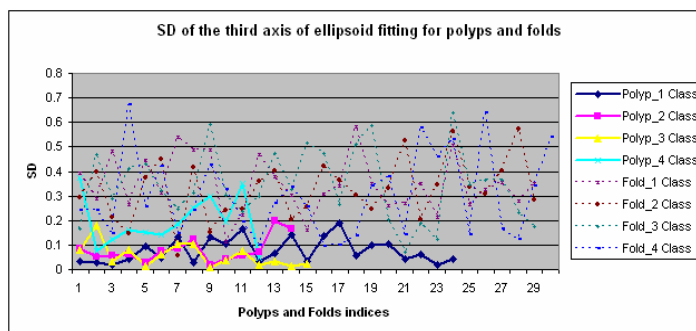


Fig. 17. Standard deviation of the third axis of the fitted ellipsoid for different classes of polyps and folds.

SD of the third axis of the fitted ellipsoid (Fig. 17)

Polyp_1	Polyp_2	Polyp_3	Polyp_4	Fold_1	Fold_2	Fold_3	Fold_4
0.030922	0.085022	0.080554	0.074818	0.221616	0.211017	0.247907	0.240531
0.026331	0.053301	0.179067	0.121186	0.469301	0.146297	0.311142	0.145175
0.019482	0.056408	0.033611	0.161104	0.378634	0.374616	0.592868	0.671086
0.042938	0.060548	0.079614	0.150423	0.302618	0.448588	0.300697	0.254934
0.096464	0.027865	0.013739	0.143018	0.163038	0.054485	0.235748	0.421387
0.049057	0.073458	0.059941	0.183757	0.305443	0.416034	0.296043	0.147645
0.131937	0.085076	0.106351	0.249652	0.340664	0.150107	0.471642	0.242293
0.030523	0.121214	0.102462	0.298455	0.584133	0.239268	0.325287	0.42494
0.131593	0.02072	0.009502	0.195151	0.351533	0.247907	0.514573	0.325723
0.102701	0.04097	0.038171	0.34916	0.26254	0.357695	0.475048	0.191947
0.165705	0.055239	0.077087	0.049518	0.267784	0.404156	0.267372	0.098454
0.031002	0.07212	0.019198		0.351621	0.202878	0.508999	0.269614
0.06774	0.198869	0.031727		0.210872	0.2559	0.586875	0.335391
0.142147		0.012774		0.508079	0.423368	0.202097	0.253733
0.03492		0.021571		0.263369	0.363739	0.070902	0.094643
0.135707				0.327019	0.304086	0.187436	0.100104
0.188389				0.353891	0.247875	0.121064	0.135416
0.057265				0.279613	0.331036	0.638865	0.342595
0.097232				0.348324	0.527417	0.345888	0.376923
0.106355				0.527922	0.202316	0.365799	0.144068
0.042701				0.635506	0.345888	0.366759	0.577019
0.060548				0.442731	0.564253	0.23122	0.45825
0.021263				0.531225	0.336216	0.176635	0.529133
0.042142				0.446675	0.309096	0.349039	0.139719
				0.573928	0.40359	0.368282	0.639217
				0.443175	0.572788	0.332178	0.16442
				0.523194	0.285961	0.486709	0.12462
				0.568588	0.535142	0.510207	0.339433
				0.052148	0.148166	0.192936	0.541017
				0.438531	0.224876	0.100453	0.266666
				0.157283	0.112822	0.558871	0.187786

Class mean: **0.077294**   **0.073139**   **0.057691**   **0.179658**   **0.375193**   **0.314438**   **0.346437**   **0.296254**

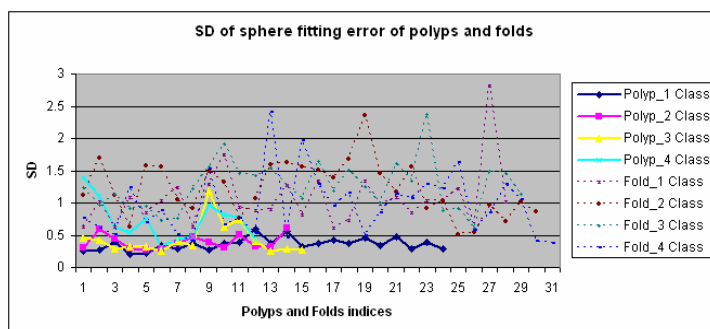


Fig. 18. Standard deviation of the sphere fit error for different classes of polyyps and folds.

SD of the sphere fit error (Fig. 18)

Polyp_1	Polyp_2	Polyp_3	Polyp_4	Fold_1	Fold_2	Fold_3	Fold_4	
0.02865	0.042504	0.032161	0.172265	0.124385	0.197484	0.202233	0.268656	
0.029777	0.070978	0.03061	0.079914	0.17257	0.08466	0.159736	0.154682	
0.02548	0.034811	0.022475	0.155506	0.146243	0.203117	0.282393	0.234046	
0.034204	0.035352	0.02739	0.113024	0.170136	0.206188	0.202245	0.127306	
0.025851	0.025753	0.020027	0.021791	0.13075	0.092696	0.21409	0.245287	
0.01638	0.048288	0.016289	0.032326	0.14186	0.13848	0.214801	0.098489	
0.051164	0.020307	0.017959	0.044388	0.136166	0.172193	0.193154	0.073619	
0.024367	0.031167	0.019828	0.073917	0.395263	0.128733	0.187443	0.127678	
0.030564	0.01953	0.120543	0.077112	0.065988	0.202233	0.318792	0.227724	
0.067981	0.018468	0.103853	0.152231	0.156941	0.162002	0.135043	0.158058	
0.04462	0.029274	0.14169	0.058801	0.126666	0.212899	0.202651	0.110507	
0.05642	0.035238	0.018233		0.097652	0.172714	0.302788	0.242711	
0.042504	0.067876	0.013729		0.161426	0.220634	0.254508	0.109323	
0.06316		0.030553		0.218476	0.180234	0.202264	0.211707	
0.019984		0.022689		0.114164	0.158038	0.247305	0.257253	
0.052606				0.128461	0.191581	0.204356	0.158078	
0.033087				0.121911	0.161272	0.283871	0.19123	
0.043553				0.130159	0.192945	0.242696	0.159692	
0.041179				0.188683	0.242641	0.176855	0.181789	
0.067675				0.146523	0.193215	0.21094	0.214289	
0.024335				0.351092	0.176855	0.275704	0.20074	
0.035352				0.118293	0.178657	0.259741	0.257346	
0.024983				0.245036	0.112092	0.181215	0.211385	
0.017719				0.16064	0.17025	0.153145	0.172542	
				0.265626	0.165701	0.183014	0.105956	
				0.093047	0.334262	0.169181	0.131442	
				0.097354	0.130537	0.234185	0.227938	
				0.197153	0.249126	0.158921	0.131231	
				0.108839	0.17587	0.198476	0.12089	
				0.16016	0.169252	0.140291	0.119266	
				0.117095	0.189735	0.212084	0.162911	
Class mean:	<b>0.037566</b>	<b>0.036888</b>	<b>0.042535</b>	<b>0.089207</b>	<b>0.160928</b>	<b>0.179558</b>	<b>0.213036</b>	<b>0.173993</b>

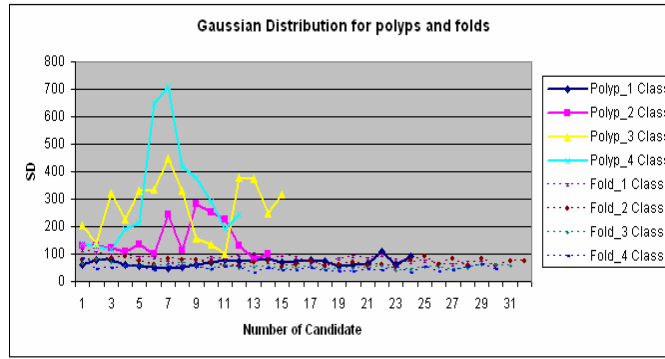


Fig. 19. The maximum value of the Gaussian distribution calculated for different classes of polyps and folds.

Gaussian distribution (Fig. 19)

Polyp_1	Polyp_2	Polyp_3	Polyp_4	Fold_1	Fold_2	Fold_3	Fold_4	
61.6537	128.7301	203.774	126.3596	76.17151	83.9922	57.54795	42.78941	
76.1788	132.3144	139.2363	115.9627	93.63821	92.60816	69.43213	47.92056	
76.71581	123.6128	321.5396	189.7483	101.344	74.99655	58.30337	51.64354	
59.35708	110.2836	224.8363	214.068	69.02731	61.74875	43.61408	50.14519	
57.55923	134.7848	330.7724	646.77	97.05788	82.57231	58.86556	38.44663	
53.57377	101.8656	336.2609	709.0612	85.72775	76.2424	46.16582	52.16608	
48.76005	242.6767	445.8307	417.6877	70.90266	78.59641	54.14107	53.46309	
53.08954	114.4136	329.7407	379.866	57.74652	68.39558	52.27255	54.11159	
58.93081	281.5418	157.6106	291.4024	82.39807	57.54795	41.39688	43.16868	
68.83039	250.483	135.2186	191.888	89.70231	55.37004	45.87554	50.92023	
77.38292	224.2805	99.79675	244.0734	81.55172	69.21051	55.22422	52.01928	
73.79362	130.1446	377.4103		97.60189	74.08701	43.84939	32.1101	
76.57799	84.23234	374.83		76.15289	50.4494	43.49168	48.86895	
81.3963		249.7644		70.88343	59.31363	47.95815	39.25521	
68.25835		316.1946		75.95905	75.86907	47.92532	37.98716	
73.25884				66.26771	57.06925	54.5424	47.04862	
76.23531				58.7041	58.76577	39.78251	41.03177	
75.49255				69.80277	68.55093	42.81938	36.76136	
58.13123				70.12504	56.28845	51.14706	35.3512	
60.28478				68.64412	61.7616	51.81784	42.97961	
65.69876				39.89142	51.14706	44.01529	41.14853	
110.2836				42.85636	76.4891	49.04754	52.74966	
62.4223				53.03721	90.8421	60.83052	31.76719	
89.79735				56.14847	61.34663	61.05629	52.15963	
				78.31749	84.36138	55.60254	34.11134	
				86.10244	57.29636	53.11225	38.77131	
				57.03487	83.19089	50.41136	51.81208	
				71.17635	58.20885	48.47323	60.85211	
				74.41705	72.73487	43.1891	42.41975	
				82.91063	72.71866	48.78329	54.8817	
				59.35321	59.89383	45.82982	47.4729	
Class mean:	<b>69.31929</b>	<b>158.4126</b>	<b>269.5211</b>	<b>320.6261</b>	<b>72.92434</b>	<b>68.76341</b>	<b>50.53304</b>	<b>45.36563</b>



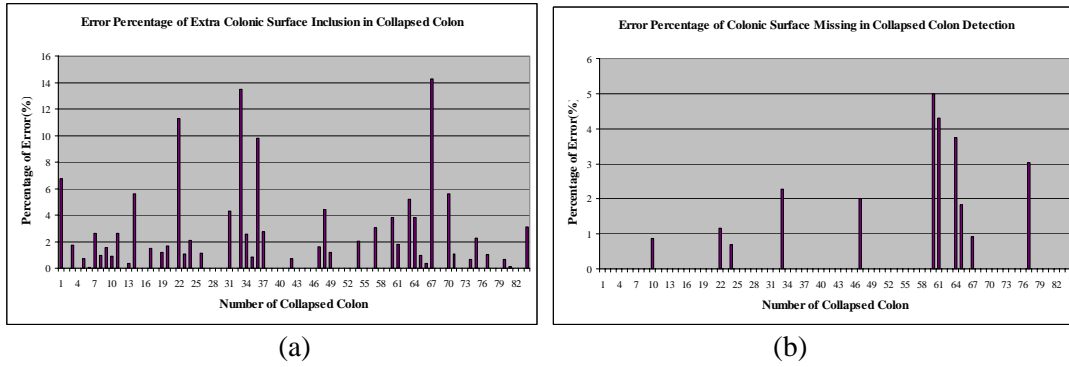


Fig. 20. Performance of the colon segmentation algorithm when applied to 84 standard dose collapsed datasets (in all datasets the colon lumen has multiple collapses). (a) Extra colon surface (ECS) inclusion. (b) Surface missed by the colon segmentation algorithm.

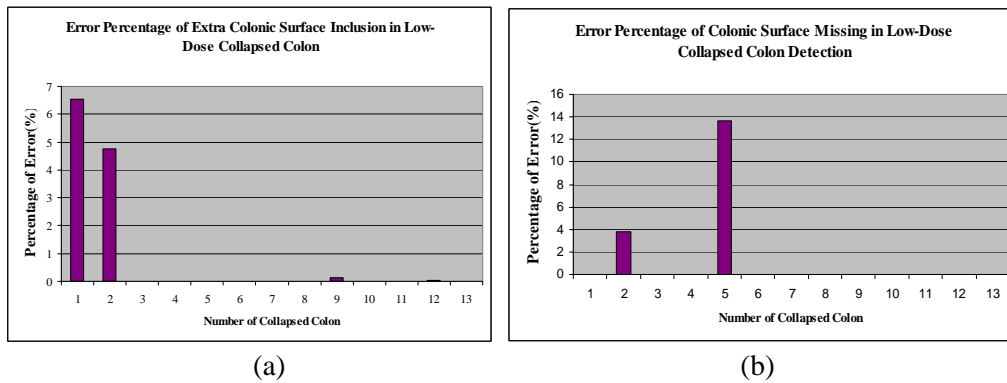


Fig. 21. Performance of the colon segmentation algorithm when applied to 13 low-dose collapsed CT data. (a) Extra colon surface (ECS) inclusion. (b) Surface missed by the colon segmentation algorithm.