

Asteroid Centroiding Exercise

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1st try

Splitting	0.2
Data Augmentation	No
Batch Size	8
Layers	18
Learning Rate	3e-3
Number of Epochs	30



#We print the best losses from training

```
print("Best MSE (loss): {}".format(cb.best))
```

```
print("Prediction error: {:.4}%".format(np.sqrt(cb.best)*100))
```

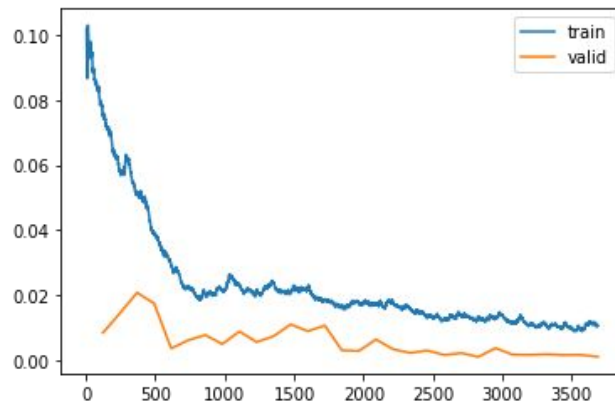


```
Best MSE (loss): 0.0011790829012170434
```

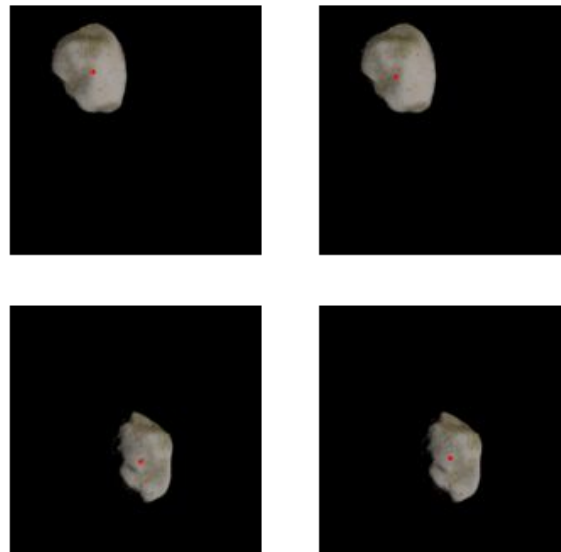
```
Prediction error: 3.434%
```

Results 1st

epoch	train_loss	valid_loss	mse	mae	time
0	0.138228	0.049434	0.049434	0.177554	00:40
epoch	train_loss	valid_loss	mse	mae	time
0	0.075934	0.008537	0.008537	0.072379	00:41
1	0.058382	0.014590	0.014590	0.094137	00:40
2	0.050967	0.020865	0.020865	0.113358	00:40
3	0.038737	0.017563	0.017563	0.107714	00:40
4	0.029618	0.003757	0.003757	0.048150	00:40
5	0.022357	0.006289	0.006289	0.064556	00:40
6	0.020220	0.007864	0.007864	0.070688	00:40
7	0.021674	0.005084	0.005084	0.058566	00:41
8	0.023475	0.008961	0.008961	0.068777	00:41
9	0.021240	0.005717	0.005717	0.061371	00:41
10	0.024002	0.007504	0.007504	0.069106	00:40
11	0.020957	0.011117	0.011117	0.082964	00:40
12	0.022127	0.009052	0.009052	0.074905	00:40
13	0.018614	0.010770	0.010770	0.076082	00:41
14	0.016515	0.003165	0.003165	0.046550	00:41
15	0.017314	0.002986	0.002986	0.043397	00:41
16	0.017538	0.006510	0.006510	0.064561	00:41
17	0.017845	0.003520	0.003520	0.047381	00:41
18	0.015931	0.002353	0.002353	0.038975	00:41
19	0.013850	0.003133	0.003133	0.044753	00:41
20	0.012564	0.001747	0.001747	0.033384	00:41
21	0.013660	0.002331	0.002331	0.040845	00:41
22	0.013560	0.001179	0.001179	0.027969	00:41
23	0.013159	0.003853	0.003853	0.053334	00:41
24	0.011547	0.001861	0.001861	0.033720	00:41
25	0.010929	0.001781	0.001781	0.034499	00:41
26	0.010774	0.001972	0.001972	0.037184	00:41
27	0.010599	0.001707	0.001707	0.033022	00:41
28	0.009551	0.001767	0.001767	0.035077	00:41
29	0.010616	0.001218	0.001218	0.028274	00:41



Target/Prediction



2nd try

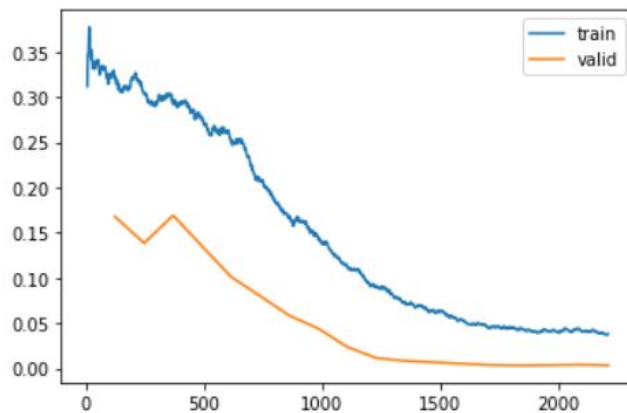
Splitting	0.2
Data Augmentation	No
Batch Size	8
Layers	18
Learning Rate	1e-3
Number of Epochs	18

```
#We print the best losses from training
print("Best MSE (loss): {}".format(cb.best))
print("Prediction error: {:.4}%".format(np.sqrt(cb.best)*100))
```

Best MSE (loss): 0.0030749167781323195
Prediction error: 5.545%

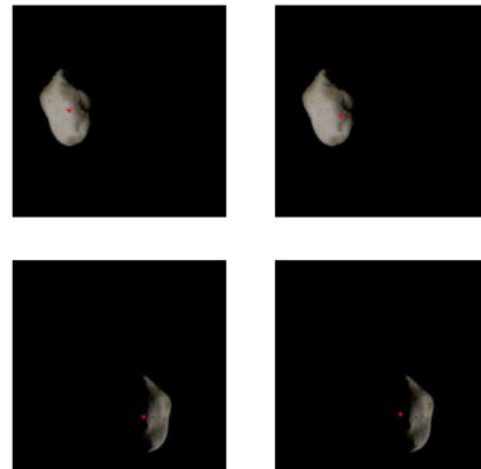
Results 2nd

epoch	train_loss	valid_loss	mse	mae	time
0	0.321743	0.167586	0.167586	0.359436	00:41
1	0.304507	0.138304	0.138304	0.320912	00:40
2	0.292243	0.169047	0.169047	0.353921	00:41
3	0.277816	0.134923	0.134923	0.310890	00:41
4	0.251145	0.101006	0.101006	0.262363	00:41
5	0.209075	0.079927	0.079927	0.233588	00:41
6	0.168652	0.058451	0.058451	0.203010	00:41
7	0.144172	0.043990	0.043990	0.170630	00:41
8	0.112668	0.023596	0.023596	0.121781	00:41
9	0.090213	0.011310	0.011310	0.082778	00:42
10	0.071722	0.008196	0.008196	0.071132	00:42
11	0.062903	0.006628	0.006628	0.064981	00:41
12	0.053254	0.004967	0.004967	0.055604	00:41
13	0.045630	0.003591	0.003591	0.046885	00:41
14	0.043733	0.003075	0.003075	0.043960	00:41
15	0.040866	0.003424	0.003424	0.046337	00:41
16	0.043251	0.003994	0.003994	0.049579	00:41
17	0.038261	0.003265	0.003265	0.045600	00:41

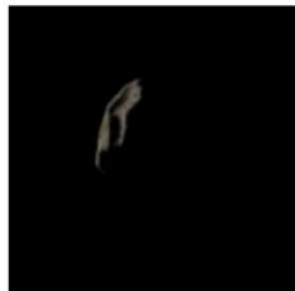


Best MSE (loss): 0.0030749167781323195
Prediction error: 5.545%

Target/Prediction



Worst and Best Cases 2nd



Worst



Best

3rd try

Splitting	0.2
Data Augmentation	No
Batch Size	8
Layers	18
Learning Rate	3e-2
Number of Epochs	30

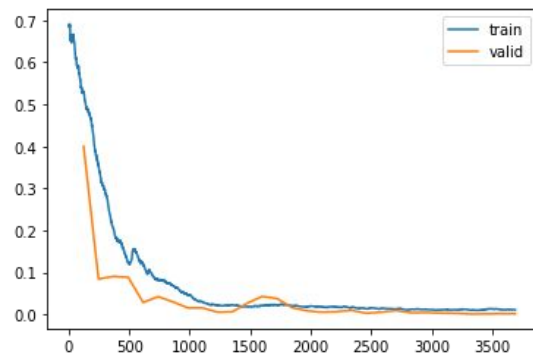
```
[29] #We print the best losses from training
      print("Best MSE (loss): {}".format(cb.best))
      print("Prediction error: {:.4}%".format(np.sqrt(cb.best)*100))
```

```
Best MSE (loss): 0.0013703302247449756
Prediction error: 3.702%
```

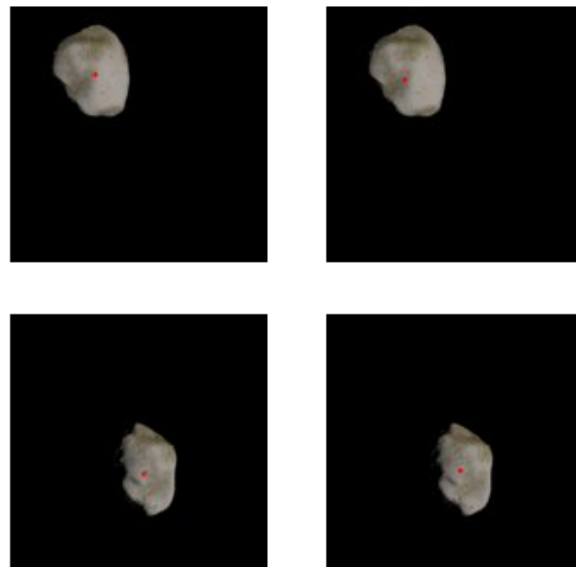
epoch	train_loss	valid_loss	mse	mae	time
0	0.543892	0.638523	0.638523	0.734113	00:40

epoch	train_loss	valid_loss	mse	mae	time
0	0.531149	0.399993	0.399993	0.553584	00:41
1	0.358021	0.084402	0.084402	0.240382	00:40
2	0.205037	0.090637	0.090637	0.252182	00:41
3	0.122111	0.088525	0.088525	0.262987	00:40
4	0.119374	0.028755	0.028755	0.117182	00:40
5	0.082188	0.042577	0.042577	0.138804	00:40
6	0.089099	0.030217	0.030217	0.129442	00:41
7	0.047435	0.015824	0.015824	0.097279	00:41
8	0.029883	0.015594	0.015594	0.101083	00:41
9	0.021299	0.005729	0.005729	0.081108	00:41
10	0.023540	0.006701	0.006701	0.067429	00:41
11	0.018847	0.027101	0.027101	0.138081	00:42
12	0.020881	0.043016	0.043016	0.177233	00:41
13	0.022612	0.038132	0.038132	0.183290	00:41
14	0.020484	0.016438	0.016438	0.103928	00:42
15	0.018299	0.008899	0.008899	0.075346	00:41
16	0.018575	0.005892	0.005892	0.080594	00:41
17	0.018080	0.006887	0.006887	0.071114	00:41
18	0.017041	0.010014	0.010014	0.085045	00:42
19	0.013734	0.003154	0.003154	0.045799	00:41
20	0.014951	0.005822	0.005822	0.064263	00:41
21	0.013214	0.009543	0.009543	0.081420	00:41
22	0.011988	0.004073	0.004073	0.048630	00:41
23	0.012327	0.004886	0.004886	0.059268	00:41
24	0.011354	0.003549	0.003549	0.050490	00:41
25	0.011100	0.002987	0.002987	0.044884	00:41
26	0.010616	0.001370	0.001370	0.030723	00:41
27	0.012372	0.001595	0.001595	0.032417	00:41
28	0.012672	0.002245	0.002245	0.039625	00:41
29	0.010990	0.001929	0.001929	0.035734	00:41

Results 3rd



Target/Prediction

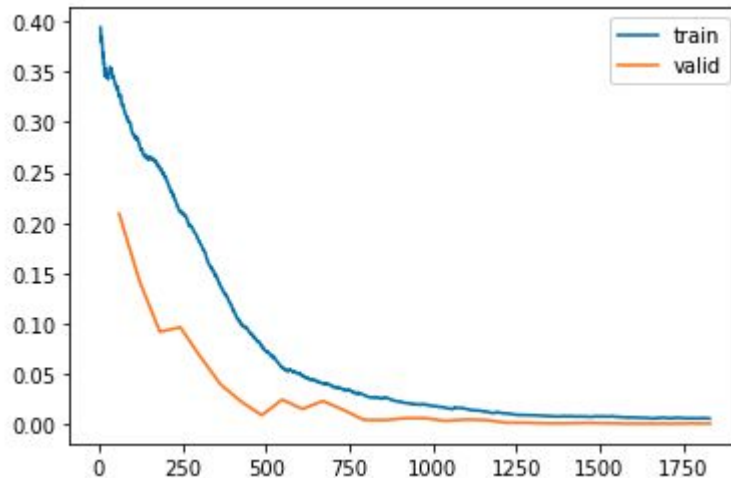


4th try

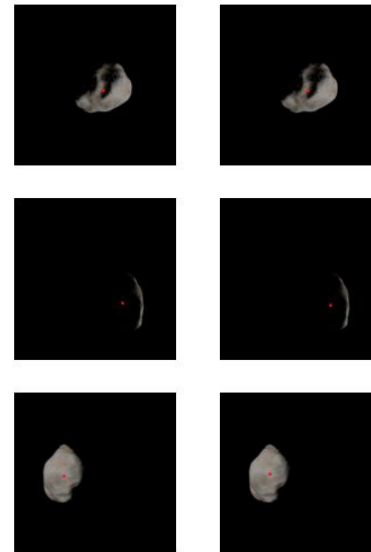
Splitting	0.2
Data Augmentation	No
Batch Size	16
Layers	18
Learning Rate	3e-3
Number of Epochs	30

epoch	train_loss	valid_loss	mse	mae	time
0	0.326759	0.208925	0.208925	0.392808	00:39
1	0.278123	0.142027	0.142027	0.317905	00:39
2	0.254089	0.091813	0.091813	0.245995	00:38
3	0.210678	0.096314	0.096314	0.254381	00:38
4	0.179449	0.066615	0.066615	0.193530	00:38
5	0.136796	0.039190	0.039190	0.142397	00:38
6	0.099872	0.022393	0.022393	0.115447	00:38
7	0.077724	0.009021	0.009021	0.067386	00:38
8	0.056376	0.024460	0.024460	0.111225	00:38
9	0.048503	0.015238	0.015238	0.086622	00:38
10	0.040452	0.023097	0.023097	0.096646	00:38
11	0.034658	0.014333	0.014333	0.093978	00:38
12	0.029188	0.004399	0.004399	0.050458	00:38
13	0.025790	0.004096	0.004096	0.046234	00:38
14	0.021270	0.006004	0.006004	0.060507	00:38
15	0.019572	0.006136	0.006136	0.064033	00:38
16	0.016575	0.003394	0.003394	0.046210	00:38
17	0.015339	0.004674	0.004674	0.052523	00:39
18	0.012485	0.004222	0.004222	0.050447	00:39
19	0.010959	0.001594	0.001594	0.031505	00:39
20	0.009219	0.001516	0.001516	0.030937	00:38
21	0.008334	0.000964	0.000964	0.024434	00:38
22	0.007923	0.000993	0.000993	0.024449	00:38
23	0.007678	0.001346	0.001346	0.029261	00:39
24	0.007471	0.001066	0.001066	0.026177	00:38
25	0.006423	0.000689	0.000689	0.020412	00:38
26	0.006223	0.000730	0.000730	0.021456	00:38
27	0.005975	0.000620	0.000620	0.019469	00:39
28	0.006031	0.000927	0.000927	0.024130	00:40
29	0.005665	0.000715	0.000715	0.021000	00:39

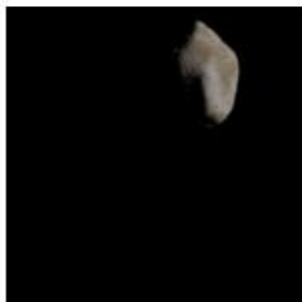
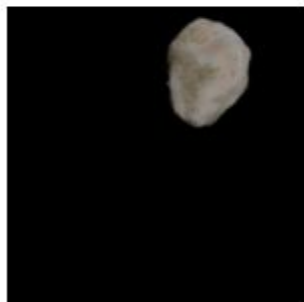
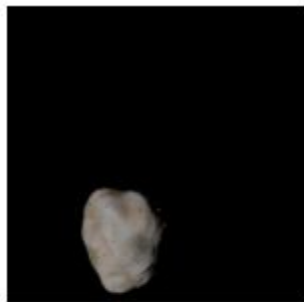
Results 4th



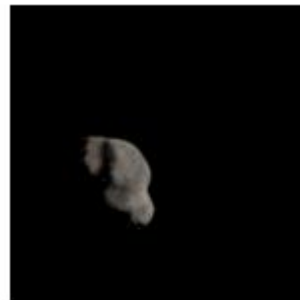
Best MSE (loss): 0.0006197387119755149
 Prediction error: 2.489%



Worst and Best Cases 4th



Worst



Best

Example prediction 4th

Example of target/prediction of validation set:

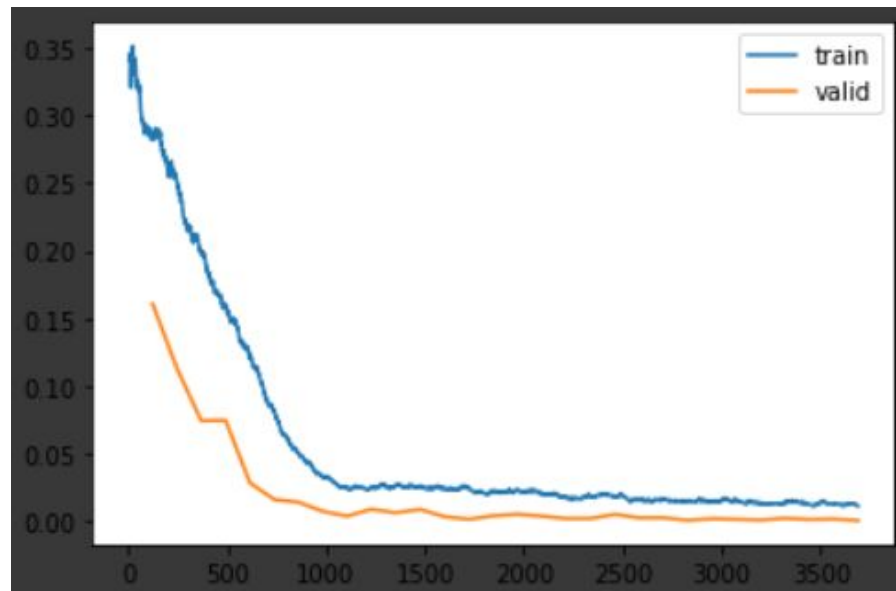


Data Augmentation

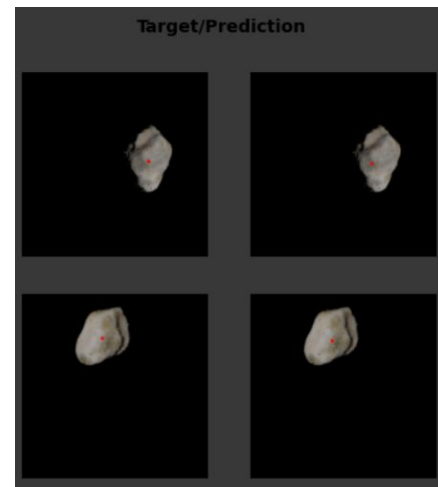
It works, we didnt have time

Results 5th

epoch	train_loss	valid_loss	mse	mae	time
0	0.386539	0.318828	0.318828	0.500359	00:32
epoch	train_loss	valid_loss	mse	mae	time
0	0.287190	0.160929	0.160929	0.340836	00:33
1	0.252285	0.113317	0.113317	0.284245	00:33
2	0.199186	0.074568	0.074568	0.225481	00:33
3	0.159704	0.074861	0.074861	0.222854	00:32
4	0.121347	0.028831	0.028831	0.135615	00:33
5	0.082030	0.016292	0.016292	0.099816	00:33
6	0.050865	0.014335	0.014335	0.095833	00:32
7	0.032640	0.007557	0.007557	0.069125	00:33
8	0.024811	0.004063	0.004063	0.051644	00:32
9	0.025126	0.009132	0.009132	0.072842	00:32
10	0.026539	0.006506	0.006506	0.062039	00:33
11	0.026645	0.008985	0.008985	0.078100	00:32
12	0.024792	0.003635	0.003635	0.049501	00:32
13	0.024952	0.001864	0.001864	0.031356	00:32
14	0.022707	0.004312	0.004312	0.051779	00:32
15	0.023371	0.005447	0.005447	0.059001	00:32
16	0.020774	0.004066	0.004066	0.052280	00:32
17	0.017922	0.002206	0.002206	0.038774	00:33
18	0.018973	0.002243	0.002243	0.036230	00:32
19	0.018831	0.005409	0.005409	0.060368	00:33
20	0.016249	0.002764	0.002764	0.044732	00:33
21	0.016364	0.002799	0.002799	0.044993	00:33
22	0.015576	0.000980	0.000980	0.024720	00:33
23	0.015127	0.002077	0.002077	0.035104	00:33
24	0.016095	0.001667	0.001667	0.034193	00:33
25	0.013912	0.001175	0.001175	0.028525	00:33
26	0.014106	0.002412	0.002412	0.039215	00:33
27	0.012662	0.001581	0.001581	0.031309	00:33
28	0.013572	0.001870	0.001870	0.036043	00:33
29	0.011542	0.000798	0.000798	0.022407	00:34



Best MSE (loss): 0.0007979496149346232
Prediction error: 2.825%



Worst and Best Cases 5th



Worst



Best