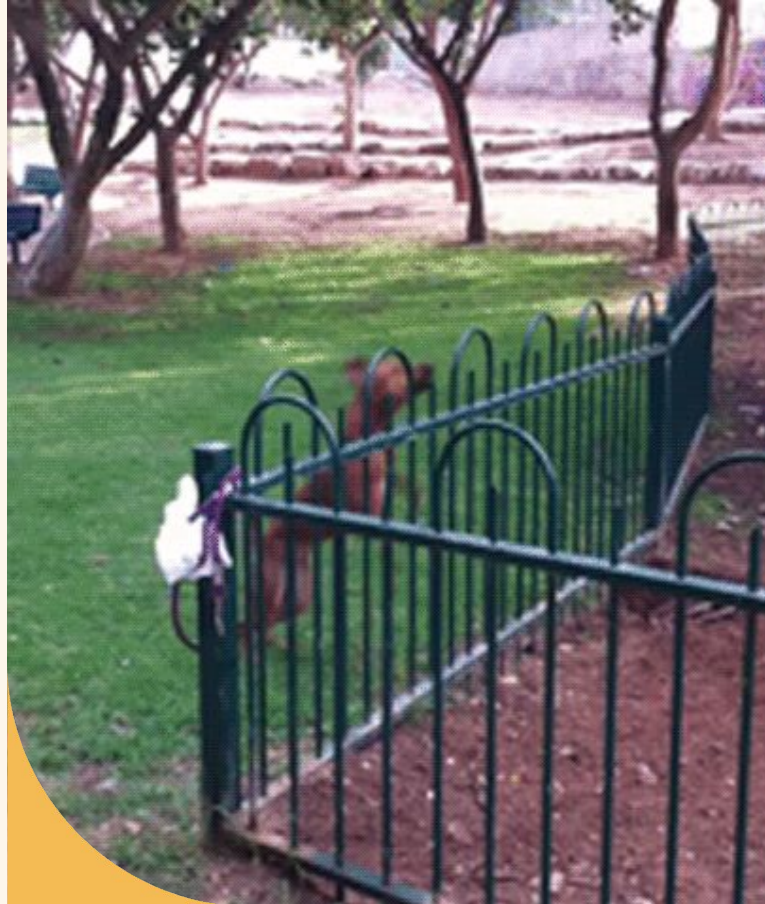
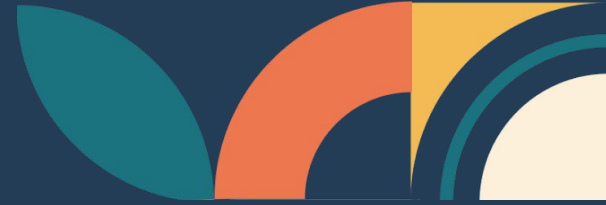




Milecia McGregor @FlippedCoding
Developer Advocate @DVCorg

Using Reproducible Experiments To Create **Better Models**





Common issues





Find the best combo of hyperparams, algorithms, and datasets

Common issues



Keep track of all of the changes

Common issues



Hard to follow changes over time

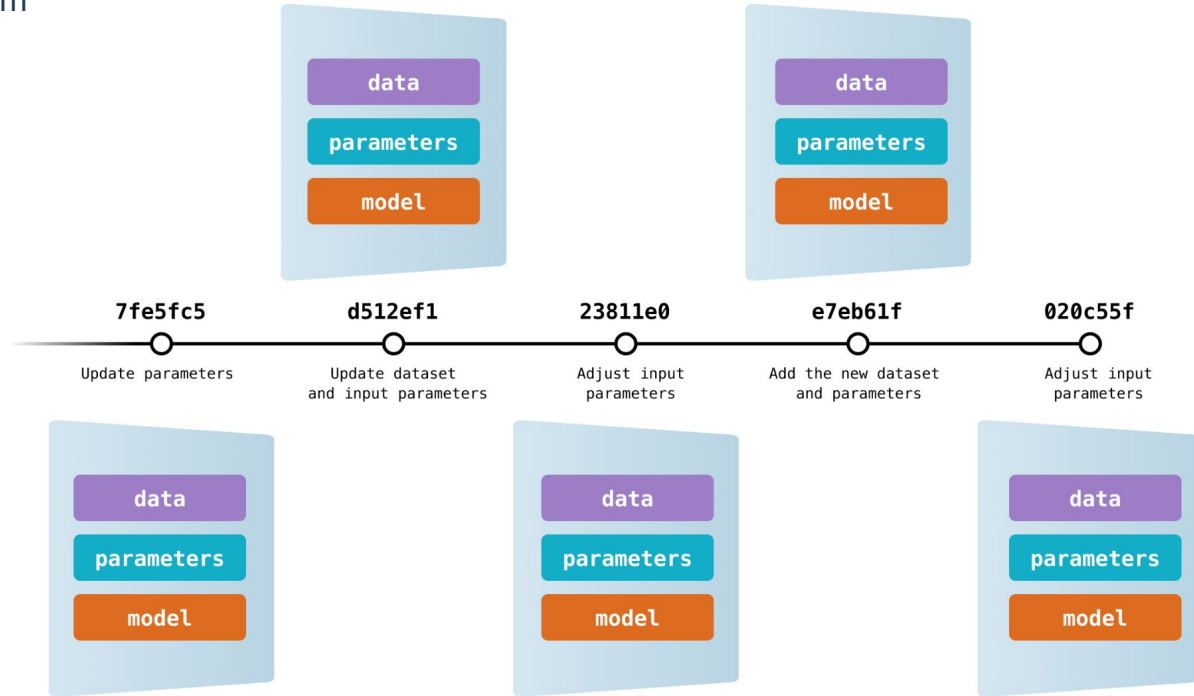
Common issues



How to fix them



How to fix them





Background on tuning hyperparameters



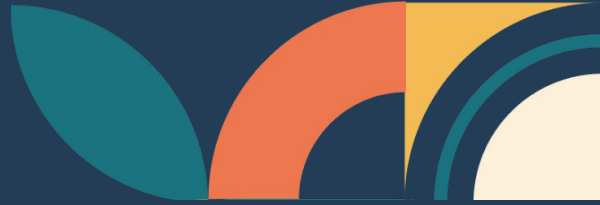
Parameters that define **the model**

Background on tuning
hyperparameters



Grid search and random search

Background on tuning
hyperparameters



Using DVC

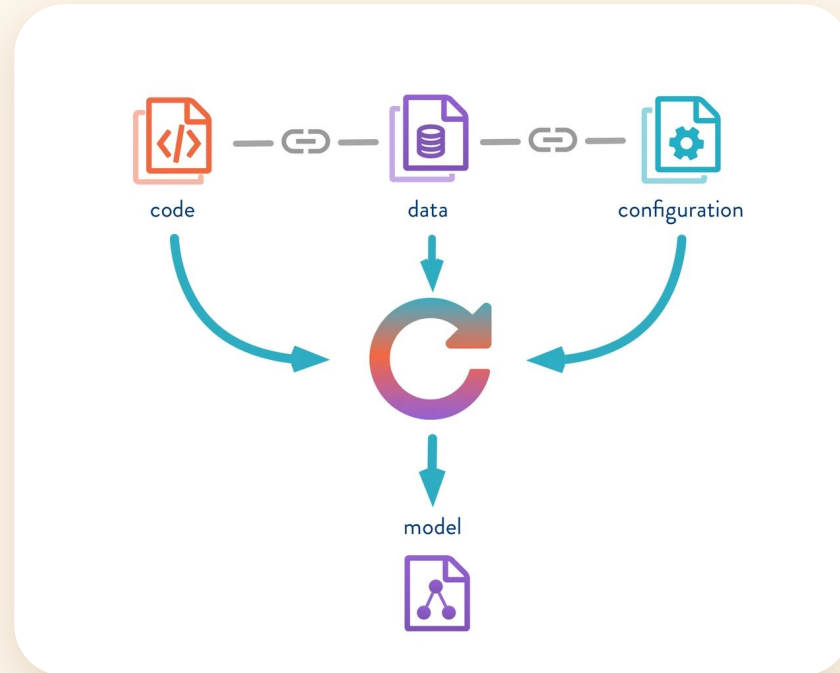


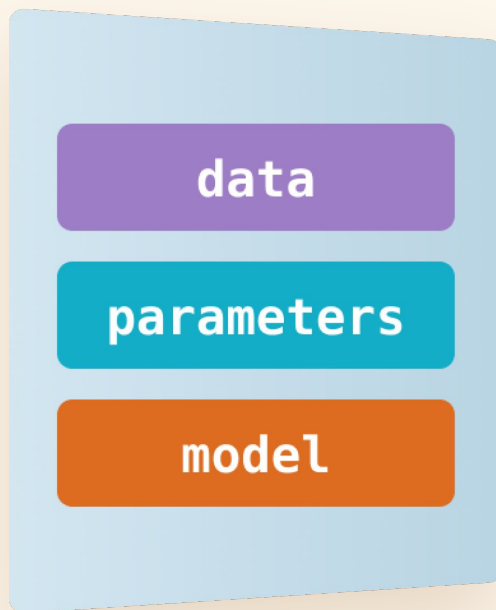


- ✓ **Open-Source**
- ✓ **Works on top of Git**
- ✓ **No libraries, no API calls**



dvc exp run







Experiment	Created	avg_prec	roc_auc	train.n_est	train.min_split
workspace	-	0.50777	0.93277	3491	9481
pydata-global-demo	11:20 AM	0.50777	0.93277	3491	9481



Hyperparameter tuning



dvc exp run --queue



Experiment	Created	State	avg_prec	roc_auc	train.n_est	train.min_split
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...

— bd650c6	11:39 AM	Queued	—	—	208	405
— 57965ef	11:39 AM	Queued	—	—	208	355
— 2f22896	11:39 AM	Queued	—	—	208	305
— 5d5a89a	11:39 AM	Queued	—	—	104	505
— 35440cf	11:38 AM	Queued	—	—	104	455
— 4ae0a83	11:38 AM	Queued	—	—	104	405



dvc exp run --run-all

dvc exp show



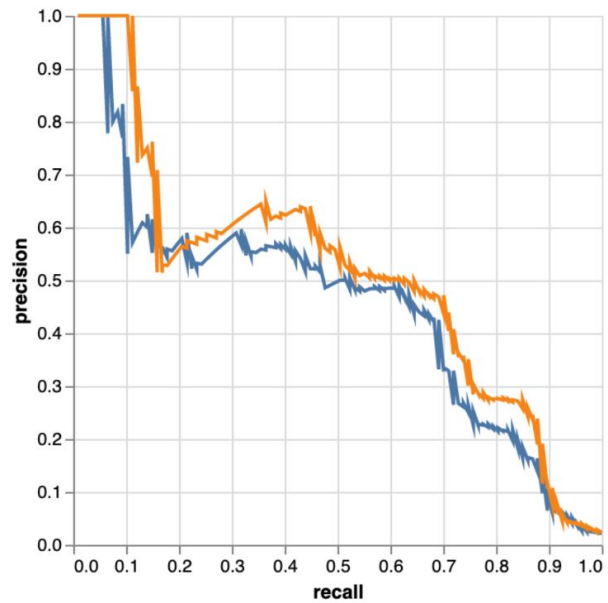
Experiment	Created	State	avg_prec	roc_auc	train.n_est	train.min_split
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...

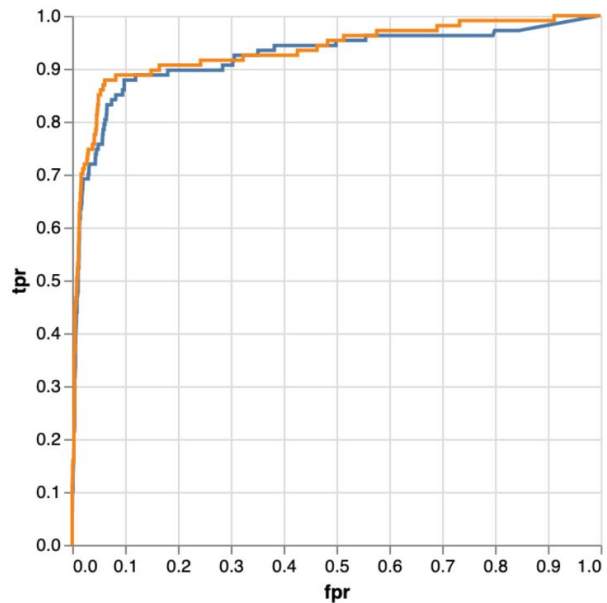
— d94def0 [exp-a3e85]	11:47 AM	0.46291	0.92209	26	355
— f0c14a8 [exp-9f204]	11:47 AM	0.4618	0.92242	26	405
— ff614c1 [exp-9d023]	11:47 AM	0.46011	0.92273	26	455
— fef55f0 [exp-6182a]	11:47 AM	0.45807	0.9224	26	505
— ad43392 [exp-23b50]	11:47 AM	0.49824	0.93115	52	305
— c419b07 [exp-8af1d]	11:47 AM	0.48708	0.93127	52	355
— 60129f0 [exp-8a48f]	11:47 AM	0.48668	0.93157	52	405
— 861290e [exp-fcf13]	11:47 AM	0.48088	0.93153	52	455
— a862c0d [exp-fcbc6]	11:47 AM	0.47808	0.93124	52	505
— 82d0dd1 [exp-c3313]	11:47 AM	0.4971	0.93416	104	305
— 08c44b3 [exp-5c576]	11:47 AM	0.50137	0.93418	104	355



dvc plots diff exp-6182a exp-cb998



rev
— exp-6182a
— exp-cb998



rev
— exp-6182a
— exp-cb998





dvc exp run --queue



Experiment	Created	State	avg_prec	roc_auc	train.n_est	train.min_split
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...

— 9de8324 [exp-72bbe]	11:46 AM	—	0.50657	0.93442	208	455
— b7212f1 [exp-11f70]	11:46 AM	—	0.50498	0.9345	208	505
— 09da090	01:28 PM	Queued	—	—	92	435
— f8f101b	01:28 PM	Queued	—	—	133	315
— dbdae9e	01:28 PM	Queued	—	—	124	499



dvc exp run --run-all

dvc exp show



Experiment	Created	State	avg_prec	roc_auc	train.n_est	train.min_split
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...

pydata-global-demo	11:20 AM	0.50777	0.93277	3491	9481
— 374602f [exp-d34f4]	01:30 PM	0.49272	0.93431	124	499
— c19f5e6 [exp-53557]	01:30 PM	0.49607	0.93295	133	315
— c006e88 [exp-99438]	01:30 PM	0.49328	0.93233	92	435



dvc exp run --queue



Experiment	Created	State	avg_prec	roc_auc	train.n_est	train.min_split
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...

— 5261909	02:41 PM	Queued	—	—	56	431
— 9d0006f	02:41 PM	Queued	—	—	42	370
— d443097	02:41 PM	Queued	—	—	60	450



dvc exp run --run-all

dvc exp show



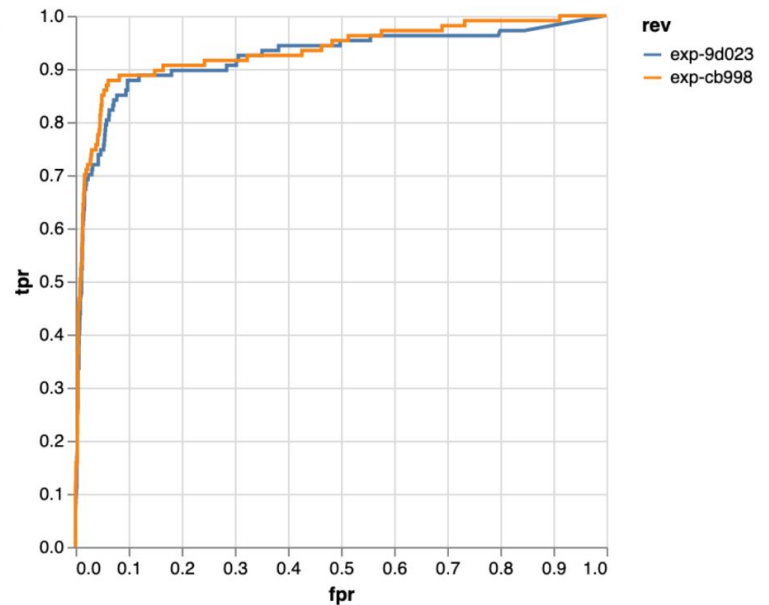
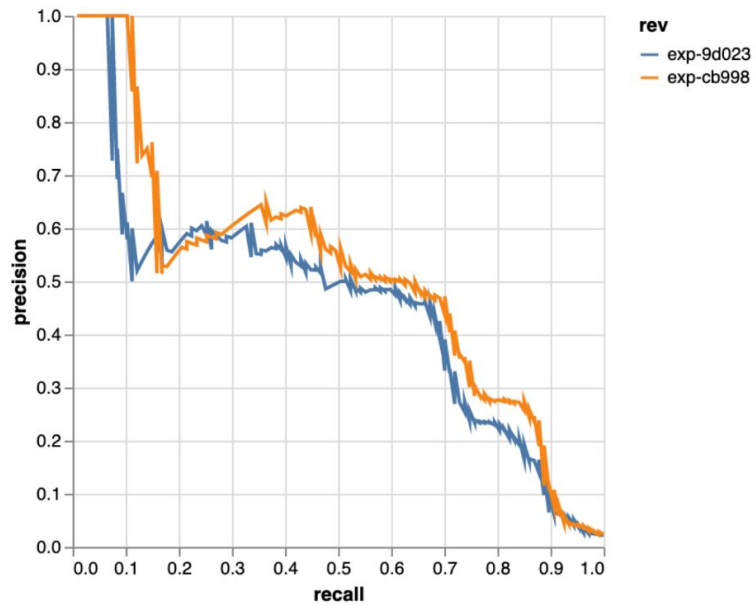
Experiment	Created	State	avg_prec	roc_auc	train.n_est	train.min_split
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...

— 2167c60 [exp-72243]	02:19 PM	—	0.49708	0.935	124	499
— 961e6e4 [exp-9d8b3]	02:19 PM	—	0.50229	0.93497	133	315
— 5b262d3 [exp-7fcde]	02:19 PM	—	0.50981	0.9351	92	435



dvc plots diff exp-9d023 exp-cb998



Experiment	Created	State	avg_prec	roc_auc	train.n_est	train.min_split
workspace	-	-	0.50777	0.93277	3491	9481
pydata-global-demo	11:20 AM	-	0.50777	0.93277	3491	9481
— 7359316 [exp-30bbc]	02:42 PM	-	0.4924	0.92992	60	450
— 4c35020 [exp-5c935]	02:42 PM	-	0.48878	0.92849	42	370
— 85889af [exp-ec22b]	02:42 PM	-	0.49165	0.92678	56	431
— 2167c60 [exp-72243]	02:19 PM	-	0.49708	0.935	124	499
— 961e6e4 [exp-9d8b3]	02:19 PM	-	0.50229	0.93497	133	315
— 5b262d3 [exp-7fcde]	02:19 PM	-	0.50981	0.9351	92	435
— 374602f [exp-d34f4]	01:30 PM	-	0.49272	0.93431	124	499
— c19f5e6 [exp-53557]	01:30 PM	-	0.49607	0.93295	133	315
— c006e88 [exp-99438]	01:30 PM	-	0.49328	0.93233	92	435
— 58ed4d9 [exp-8156d]	11:47 AM	-	0.47596	0.9215	26	305
— d94def0 [exp-a3e85]	11:47 AM	-	0.46291	0.92209	26	355
— f0c14a8 [exp-9f204]	11:47 AM	-	0.4618	0.92242	26	405
— ff614c1 [exp-9d023]	11:47 AM	-	0.46011	0.92273	26	455
— fef55f0 [exp-6182a]	11:47 AM	-	0.45807	0.9224	26	505
— ad43392 [exp-23b50]	11:47 AM	-	0.49824	0.93115	52	305
— c419b07 [exp-8af1d]	11:47 AM	-	0.48708	0.93127	52	355
— 60129f0 [exp-8a48f]	11:47 AM	-	0.48668	0.93157	52	405
— 861290e [exp-fcf13]	11:47 AM	-	0.48088	0.93153	52	455
— a862c0d [exp-fcbc6]	11:47 AM	-	0.47808	0.93124	52	505
— 82d0dd1 [exp-c3313]	11:47 AM	-	0.4971	0.93416	104	305
— 08c44b3 [exp-5c576]	11:47 AM	-	0.50137	0.93418	104	355
— 8d5e6fa [exp-2a6ac]	11:47 AM	-	0.50003	0.93428	104	405
— 718e41b [exp-e646a]	11:47 AM	-	0.49742	0.93434	104	455
— 6cbea41 [exp-42e05]	11:47 AM	-	0.49377	0.93464	104	505
— 7fa5d93 [exp-91eb1]	11:47 AM	-	0.50928	0.93414	208	305
— 0127047 [exp-34bbf]	11:47 AM	-	0.51009	0.93373	208	355
— e725856 [exp-cb998]	11:47 AM	-	0.51406	0.93425	208	405
— 9de8324 [exp-72bbe]	11:46 AM	-	0.50657	0.93442	208	455
— b7212f1 [exp-11f70]	11:46 AM	-	0.50498	0.9345	208	505



Key takeaways

- Adding reproducibility to experiments is important
- Using DVC helps you track every part of your experiments
- Don't be afraid to try new tools

Milecia McGregor [@FlippedCoding](#)
<https://discord.gg/zpCsrscfMW>



Resources

- dvc.org/docs
- <https://discord.gg/zpCsrscfMW>
- <https://studio.iterative.ai>

Milecia McGregor [@FlippedCoding](#)
<https://discord.gg/zpCsrscfMW>