

Software developer

Researcher

Research Assistant

Data Scientist

Research Engineer

PhD student

Researcher

Software Engineer

Researcher

Product Manager

Research engineer

PhD student

Machine Learning Engineer

Phd student

undergraduate

PhD student

Manager

iOS Developer

Student

Phd

Master

Data Scientist

Research Associate

Bachelor

Researcher

Master's Student - Research Assistant

Master

Phd student

Associate Professor

Researcher

Bachelor Student

Master of Science in Machine Learning graduate student

PhD student

PhD student

Product owner

PhD Student

Developer

Developer

Research Associate

Researcher

Researcher

Senior Data Scientist

Machine Learning Engineer

Data Engineer

ML Engineer

Machine learning engineer

Machine Learning Engineer

Researcher

PhD student

AI Engineer

PhD student

Machine learning engineer

Master student

AI Scientist

Senior Data Scientist

Postdoc Fellow

Reseach Associate

Data Scientist

PhD student

Software Engineer

PhD student

Researcher

Professor

Master

researcher in the RoboFEI robotics team, graduate student

PhD candidate

Machine Learning Engineer

Researcher

Developer

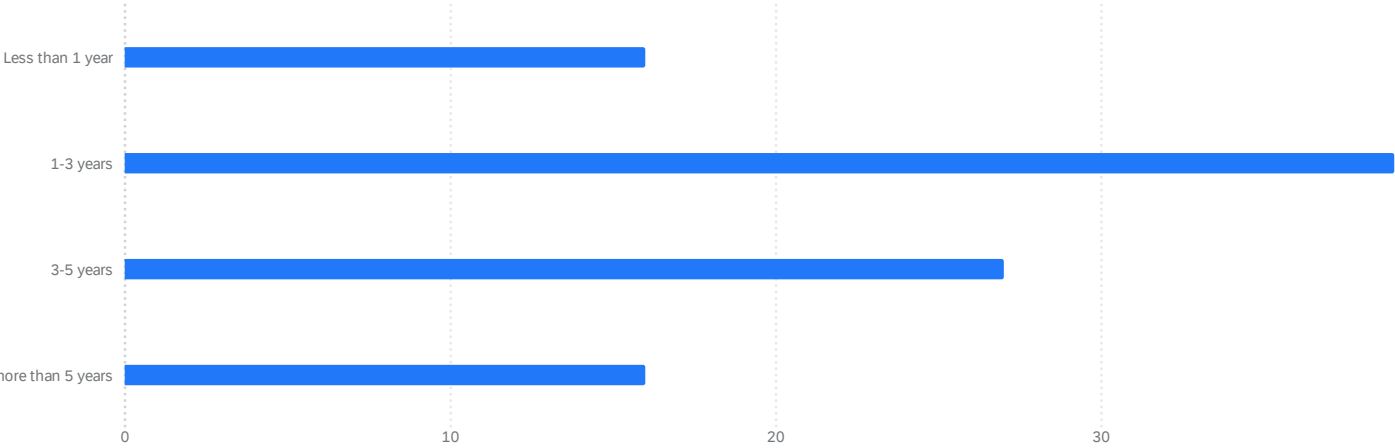
Master Graduate

Full-stack software engineer

Data Scientist

Founder, AI startup (Cloudcraftz.com)
Assistant Professor
Deep Learning practitioner
Research Associate
Developer and Researcher
PhD Candidate
Developer
Unemployed, but I guess self-employed researcher
Master
Local Agent of Innovation
Master
Master
Master, Machine learning engineer
Research Scientist
Senior Data Scientist
Software Engineer
ML Research Engineer
PhD student
Research
Machine Learning Engineer
PhD Student   Tech Manager & Senior Software Developer
PhD Student
Assistant professor
Developer/Researcher

What is your overall work/research experience with Deep Reinforcement Learning (DRL)? 98 ⓘ



What is your overall work/research experience with Deep Reinforcement Learning (DRL)? 98 ⓘ

Q3 - What is your overall work/research experience with Deep Reinforcement Learning (DRL)?	Percentage	Count
Less than 1 year	16%	16
1-3 years	40%	39
3-5 years	28%	27
more than 5 years	16%	16

What is your overall work/research experience with Deep Reinforcement Learning (DRL)? 98 ⓘ

What is your overall work/research experience with Deep Reinforcement Learning (DRL)?	Average	Minimum	Maximum	Count
Less than 1 year	1.00	1.00	1.00	16
1-3 years	2.00	2.00	2.00	39
3-5 years	3.00	3.00	3.00	27
more than 5 years	4.00	4.00	4.00	16

Python

Python

Python

Python

Python

Python

Python

Python
C/C++, Python
C/C++, Pythn
Python C# C++
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Java Swift python
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C/C++, Python

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Python
Python
Python
python
Java, c/c+,.python,scala
python, c#
Python
Python
Python, Rust
Python and Cython
Pyhton
Python
Python
Python
Python C++
Python
Python, C++
Python, C++
Python, Java

Python
Python C++
Python
C++, Python
Python
Python
Python
Python
python
python
Python, C++
Python, Makefile
Python
Python
Python
Python
Python
Python
Python
Python
Python
Python, C++, C#
Python
Python, C++



Python
C++, Python
Python
Python
Python, Javascript
Python and C++
Python, C++
Python
Mostly python, some C++
Python
C++, Python
Python
Python
Python
Python
Python
python
C++ / Python
Tensorflow, keras
Tensorflow
Pytorch
Pytorch

PyTorch, Tianshou, Stable-baselines 3

PyTorch, TesnorFlow

PyTorch

PyTorch

PyTorch

PyTorch, Tensorflow and keras

Tensorflow Keras PyTorch Tensorforce RLLib CleanRL Others...

PyTorch + OpenAI Gym library

Tensorflow, PyTorch

PyTorch, Jax

Pytorch

PyTorch

Gym

PyTorch

Tensorflow, keras, PyTorch, Keras-rl, Python-rl

Tensorflow keras

pytorch

Pytorch, Tensorflow, Keras

Tensorflow, keras, pytorch, stable-baselines 3, clean-rl

Tensorflow, keras, PyTorch

PyTorch, PyTorch-RL

Keras, PyTorch

PyTorch, Unity ML-Agents

PyTorch, stable baselines 3, OpenAI gym, Open AI baselines, tf agents

Tensorflow, keras, PyTorch
Tensorflow, PyTorch
PyTorch
Tensorflow, PyTorch
Tensorflow, keras, spacy
Tensorflow, keras, PyTorch
Pytorch
Jax, PyTorch
Tensorflow, keras
PyTorch, Tensorflow
Tensorflow、 keras、 PyTorch
Tensorflow,kereas,pytorch
Tensorflow, keras
PyTorch
PyTorch
PyTorch, Jax
Tensorflow, Keras, Keras-RL, Baselines, StableBaselines, TRFL
PyTorch
PyTorch
Tensorflow, keras, PyTorch
PyTorch, Gym
Tensorflow, Keras, pytorch.
Pytorch Tensorflow JAX
PyTorch, Tensorflow

PyTorch, TensorFlow

PyTorch, Tensorflow

PyTorch, Tensorflow

PyTorch, some Tensorflow

PyTorch, Tensorflow

PyTorch

Tensorflow, Keras, Pytorch

PyTorch, Tensorflow

Tensorflow, keras, keras-rl

PyTorch

Keras, PyTorch, Jax

PyTorch

pytorch

Tensorflow, keras, PyTorch, ROS, Gazebo

Pytorch

Tensorflow

PyTorch

PyTorch, Keras

Tensorflow

PyTorch, Keras, Tensorflow

TensorFlow and PyTorch

Pytorch, keras

Tensorflow, PyTorch, Python-rl

Tensorflow, PyTorch, gym

TensorFlow, Keras

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PyTorch

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Pytorch

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PyTorch, Keras

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Mainly PyTorch. Used all the others but they're either too high level of abstraction where you're not really doing anything intelligent (i.e. PyTorchLightning), or if they are a bit closer to the metal, they're just not as convenient as PyTorch

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PyTorch, stable-baselines

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Stable Baselines

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Mostly keras-rl

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PyTorch, TensorFlow, Keras, Cherry-RL

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Tensorflow, Keras, PyTorch

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Pytorch

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pytorch, jax, haiku, acme, other proprietary frameworks

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keras-rl

---

Tensorflow, Keras

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PyTorch, Ray + RLlib, OpenAI baselines, Unity ML-agents

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PyTorch

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PyTorch

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Tensorflow, Pytorch

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Tensorflow, Keras and PyTorch

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PyTorch Stable-baselines3 RLlib

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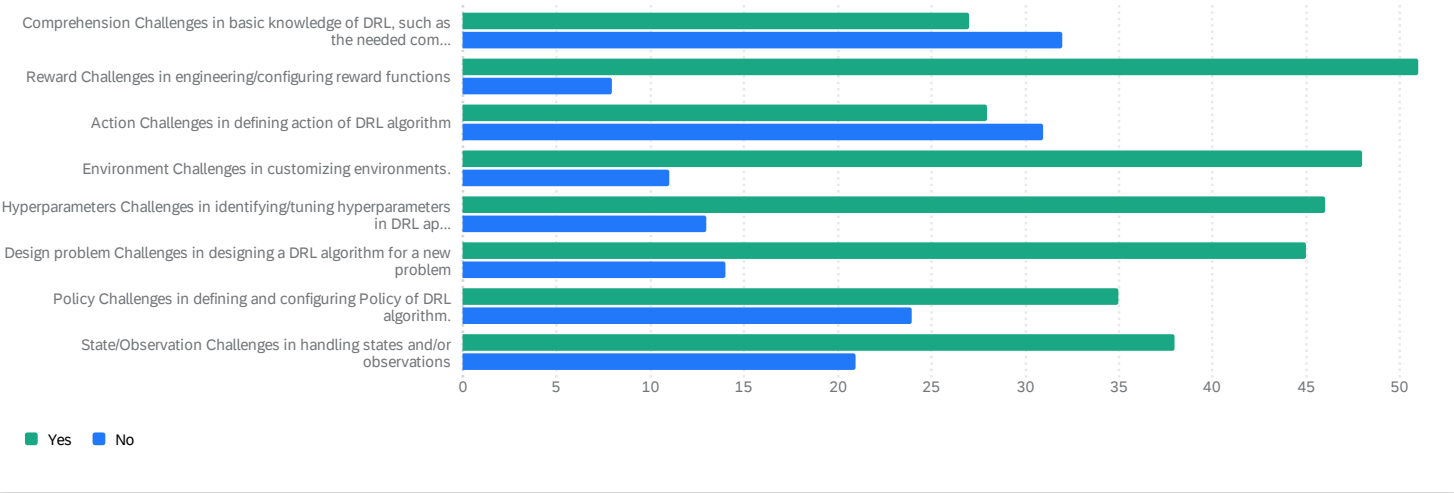
torch, tensorflow, keras

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PyTorch/ Tensorflow

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Have you ever encountered challenges related to DRL basic knowledge? - Q6#1 59 ⓘ



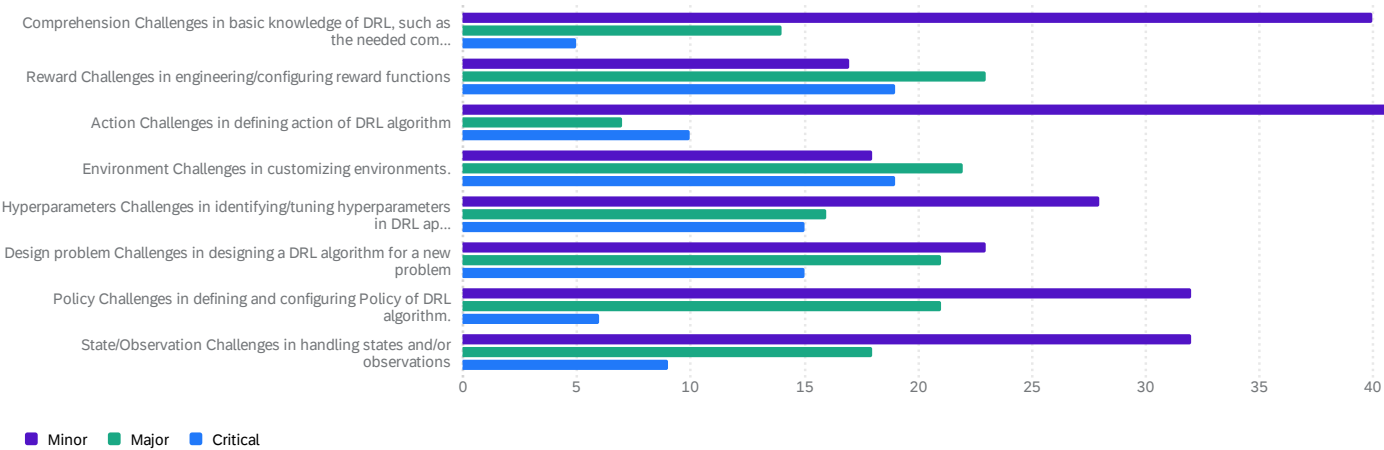
Have you ever encountered challenges related to DRL basic knowledge? - Q6#1 59 ⓘ

Q6#1	Yes	No
Comprehension Challenges in basic knowledge of DRL, such as the needed com...	27	32
Reward Challenges in engineering/configuring reward functions	51	8
Action Challenges in defining action of DRL algorithm	28	31
Environment Challenges in customizing environments.	48	11
Hyperparameters Challenges in identifying/tuning hyperparameters in DRL ap...	46	13
Design problem Challenges in designing a DRL algorithm for a new problem	45	14
Policy Challenges in defining and configuring Policy of DRL algorithm.	35	24
State/Observation Challenges in handling states and/or observations	38	21

Have you ever encountered challenges related to DRL basic knowledge? - Q6#1 59 ⓘ

Q6#1	Average	Minimum	Maximum	Count
Comprehension Challenges in basic knowledge of DRL, such as the needed com...	1.54	1.00	2.00	59
Reward Challenges in engineering/configuring reward functions	1.14	1.00	2.00	59
Action Challenges in defining action of DRL algorithm	1.53	1.00	2.00	59
Environment Challenges in customizing environments.	1.19	1.00	2.00	59
Hyperparameters Challenges in identifying/tuning hyperparameters in DRL ap...	1.22	1.00	2.00	59
Design problem Challenges in designing a DRL algorithm for a new problem	1.24	1.00	2.00	59
Policy Challenges in defining and configuring Policy of DRL algorithm.	1.41	1.00	2.00	59
State/Observation Challenges in handling states and/or observations	1.36	1.00	2.00	59

Have you ever encountered challenges related to DRL basic knowledge? - How severe was the challenge/issue 59 ⓘ



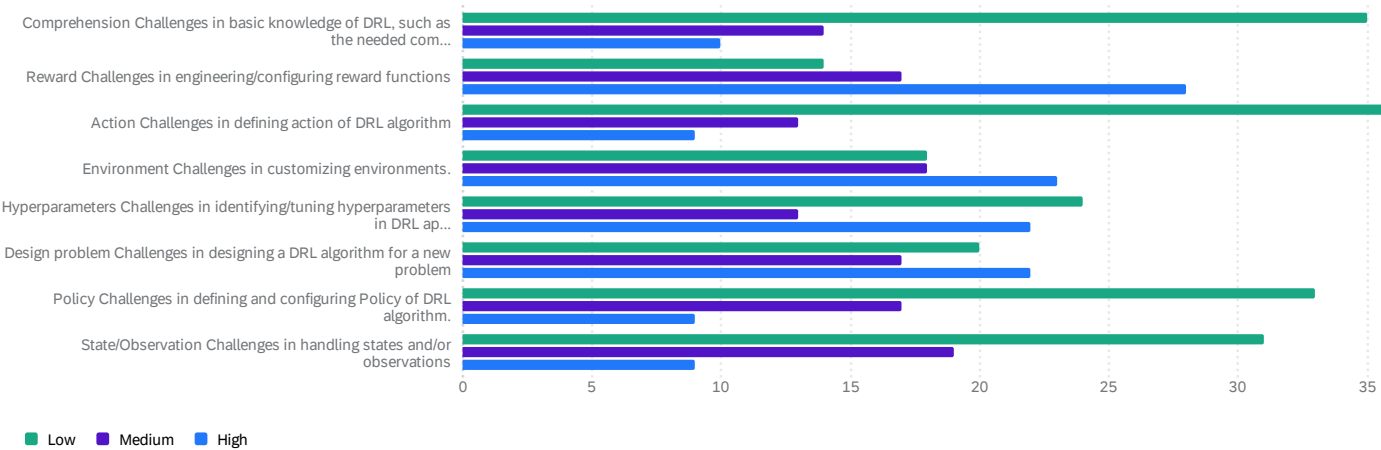
Have you ever encountered challenges related to DRL basic knowledge? - How severe was the challenge/issue 59 ⓘ

How severe was the challenge/issue	Minor	Major	Critical
Comprehension Challenges in basic knowledge of DRL, such as the needed com...	40	14	5
Reward Challenges in engineering/configuring reward functions	17	23	19
Action Challenges in defining action of DRL algorithm	42	7	10
Environment Challenges in customizing environments.	18	22	19
Hyperparameters Challenges in identifying/tuning hyperparameters in DRL ap...	28	16	15
Design problem Challenges in designing a DRL algorithm for a new problem	23	21	15
Policy Challenges in defining and configuring Policy of DRL algorithm.	32	21	6
State/Observation Challenges in handling states and/or observations	32	18	9

Have you ever encountered challenges related to DRL basic knowledge? - How severe was the challenge/issue 59 ⓘ

How severe was the challenge/issue	Average	Minimum	Maximum	Count
Comprehension Challenges in basic knowledge of DRL, such as the needed com...	1.41	1.00	3.00	59
Reward Challenges in engineering/configuring reward functions	2.03	1.00	3.00	59
Action Challenges in defining action of DRL algorithm	1.46	1.00	3.00	59
Environment Challenges in customizing environments.	2.02	1.00	3.00	59
Hyperparameters Challenges in identifying/tuning hyperparameters in DRL ap...	1.78	1.00	3.00	59
Design problem Challenges in designing a DRL algorithm for a new problem	1.86	1.00	3.00	59
Policy Challenges in defining and configuring Policy of DRL algorithm.	1.56	1.00	3.00	59
State/Observation Challenges in handling states and/or observations	1.61	1.00	3.00	59

Have you ever encountered challenges related to DRL basic knowledge? - How much effort was required to handle this challenge/issue 59 ⓘ





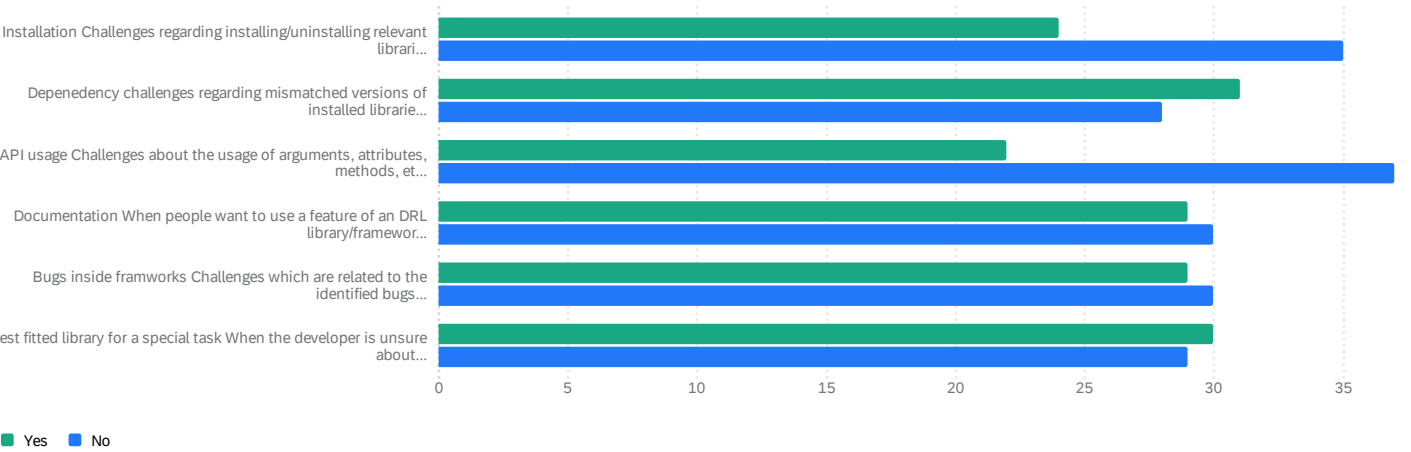
Have you ever encountered challenges related to DRL basic knowledge? - How much effort was required to handle this challenge/issue 59 ⓘ

How much effort was required to handle this challenge/issue	Low	Medium	High
Comprehension Challenges in basic knowledge of DRL, such as the needed com...	35	14	10
Reward Challenges in engineering/configuring reward functions	14	17	28
Action Challenges in defining action of DRL algorithm	37	13	9
Environment Challenges in customizing environments.	18	18	23
Hyperparameters Challenges in identifying/tuning hyperparameters in DRL ap...	24	13	22
Design problem Challenges in designing a DRL algorithm for a new problem	20	17	22
Policy Challenges in defining and configuring Policy of DRL algorithm.	33	17	9
State/Observation Challenges in handling states and/or observations	31	19	9

Have you ever encountered challenges related to DRL basic knowledge? - How much effort was required to handle this challenge/issue 59 ⓘ

How much effort was required to handle this challenge/issue	Average	Minimum	Maximum	Count
Comprehension Challenges in basic knowledge of DRL, such as the needed com...	1.58	1.00	3.00	59
Reward Challenges in engineering/configuring reward functions	2.24	1.00	3.00	59
Action Challenges in defining action of DRL algorithm	1.53	1.00	3.00	59
Environment Challenges in customizing environments.	2.08	1.00	3.00	59
Hyperparameters Challenges in identifying/tuning hyperparameters in DRL ap...	1.97	1.00	3.00	59
Design problem Challenges in designing a DRL algorithm for a new problem	2.03	1.00	3.00	59
Policy Challenges in defining and configuring Policy of DRL algorithm.	1.59	1.00	3.00	59
State/Observation Challenges in handling states and/or observations	1.63	1.00	3.00	59

Have you ever encountered challenges related to DRL library/framework usage? - Q7#1 59 ⓘ



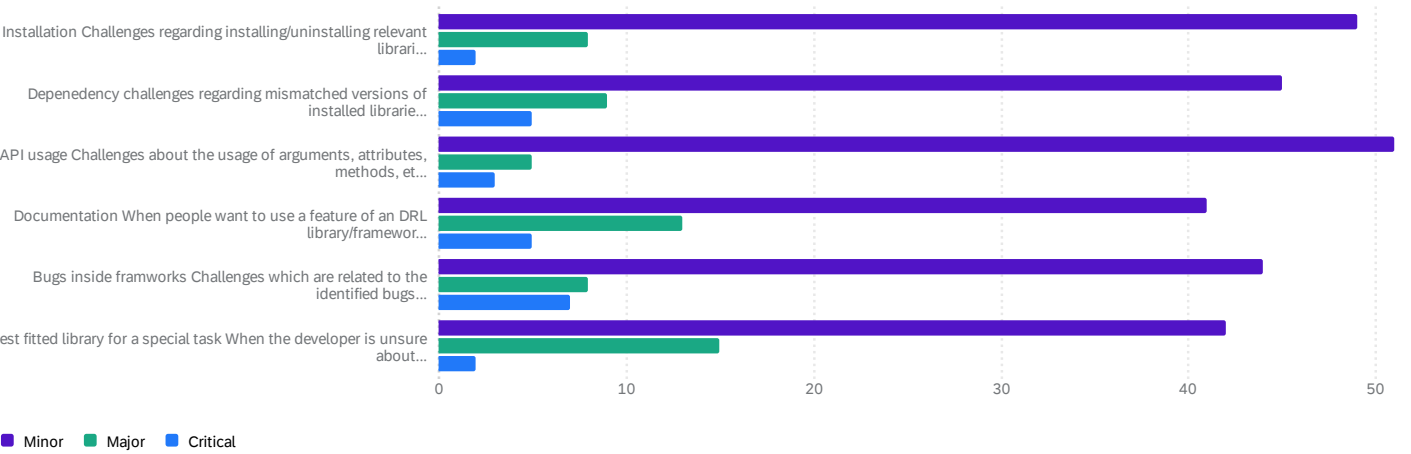
Have you ever encountered challenges related to DRL library/framework usage? - Q7#1 59 ⓘ

Q7#1	Yes	No
Installation Challenges regarding installing/uninstalling relevant librari...	24	35
Depenedency challenges regarding mismatched versions of installed librarie...	31	28
API usage Challenges about the usage of arguments, attributes, methods, et...	22	37
Documentation When people want to use a feature of an DRL library/framewor...	29	30
Bugs inside frameworks Challenges which are related to the identified bugs...	29	30
Best fitted library for a special task When the developer is unsure about...	30	29

Have you ever encountered challenges related to DRL library/framework usage? - Q7#1 59 ⓘ

Q7#1	Average	Minimum	Maximum	Count
Installation Challenges regarding installing/uninstalling relevant librari...	1.59	1.00	2.00	59
Depenedency challenges regarding mismatched versions of installed librarie...	1.47	1.00	2.00	59
API usage Challenges about the usage of arguments, attributes, methods, et...	1.63	1.00	2.00	59
Documentation When people want to use a feature of an DRL library/framewor...	1.51	1.00	2.00	59
Bugs inside frameworks Challenges which are related to the identified bugs...	1.51	1.00	2.00	59
Best fitted library for a special task When the developer is unsure about...	1.49	1.00	2.00	59

Have you ever encountered challenges related to DRL library/framework usage? - How severe was the challenge/issue 59 ⓘ



Have you ever encountered challenges related to DRL library/framework usage? - How severe was the challenge/issue 59 ⓘ

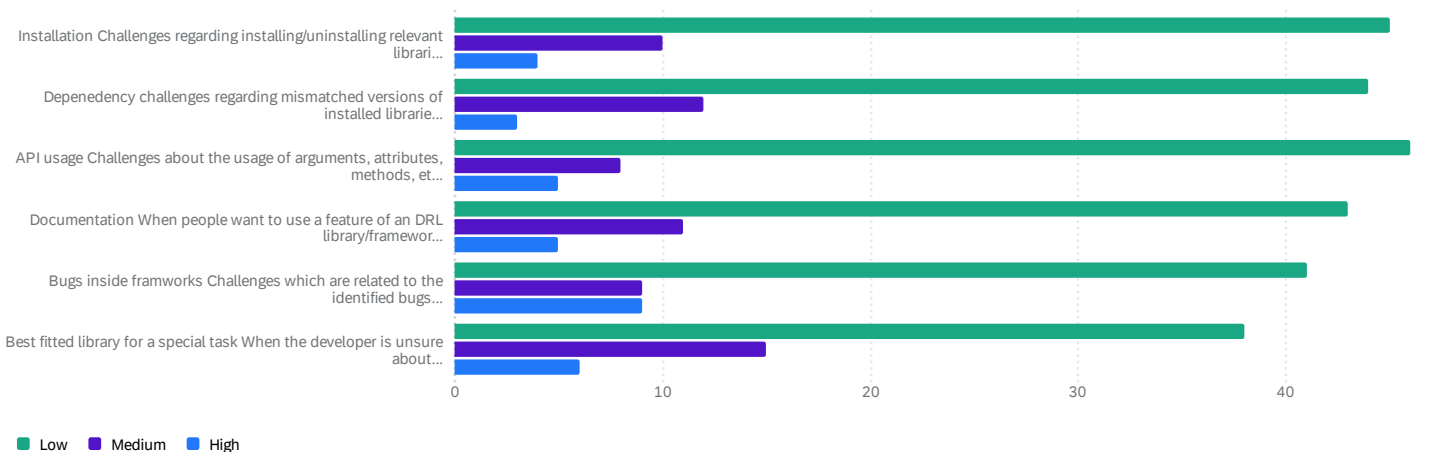
How severe was the challenge/issue	Minor	Major	Critical
Installation Challenges regarding installing/uninstalling relevant librari...	49	8	2

How severe was the challenge/issue	Minor	Major	Critical
Depenedency challenges regarding mismatched versions of installed librarie...	45	9	5
API usage Challenges about the usage of arguments, attributes, methods, et...	51	5	3
Documentation When people want to use a feature of an DRL library/framewor...	41	13	5
Bugs inside frameworks Challenges which are related to the identified bugs...	44	8	7
Best fitted library for a special task When the developer is unsure about...	42	15	2

#### Have you ever encountered challenges related to DRL library/framework usage? - How severe was the challenge/issue 59 ⓘ

How severe was the challenge/issue	Average	Minimum	Maximum	Count
Installation Challenges regarding installing/uninstalling relevant librari...	1.20	1.00	3.00	59
Depenedency challenges regarding mismatched versions of installed librarie...	1.32	1.00	3.00	59
API usage Challenges about the usage of arguments, attributes, methods, et...	1.19	1.00	3.00	59
Documentation When people want to use a feature of an DRL library/framewor...	1.39	1.00	3.00	59
Bugs inside frameworks Challenges which are related to the identified bugs...	1.37	1.00	3.00	59
Best fitted library for a special task When the developer is unsure about...	1.32	1.00	3.00	59

#### Have you ever encountered challenges related to DRL library/framework usage? - How much effort was required to handle this challenge/issue 59 ⓘ



#### Have you ever encountered challenges related to DRL library/framework usage? - How much effort was required to handle this challenge/issue 59 ⓘ

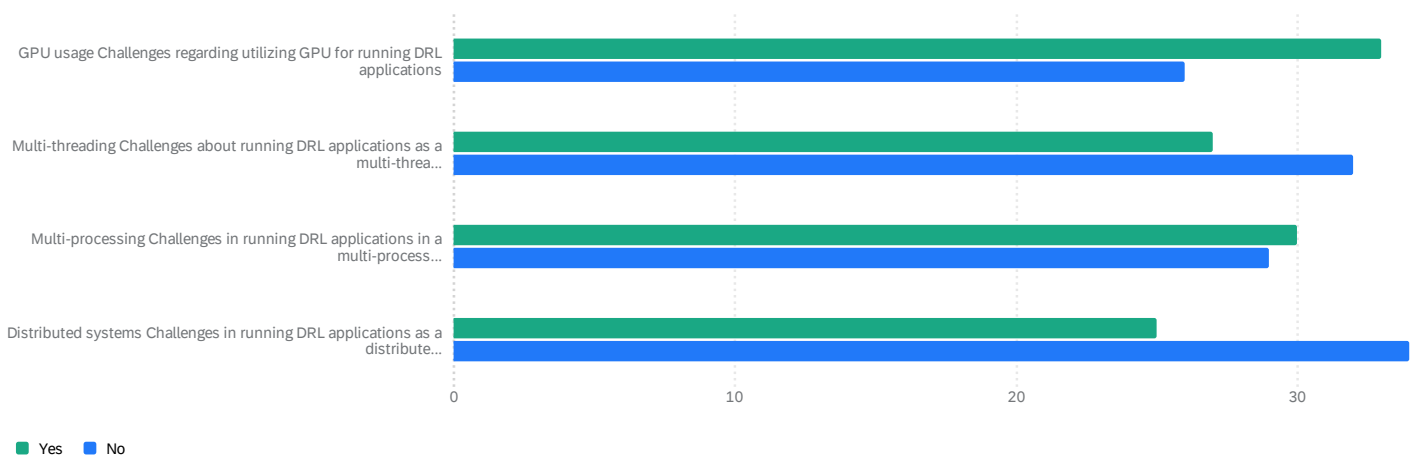
How much effort was required to handle this challenge/issue	Low	Medium	High
Installation Challenges regarding installing/uninstalling relevant librari...	45	10	4
Depenedency challenges regarding mismatched versions of installed librarie...	44	12	3

How much effort was required to handle this challenge/issue	Low	Medium	High
API usage Challenges about the usage of arguments, attributes, methods, et...	46	8	5
Documentation When people want to use a feature of an DRL library/frameworkor...	43	11	5
Bugs inside frameworks Challenges which are related to the identified bugs...	41	9	9
Best fitted library for a special task When the developer is unsure about...	38	15	6

#### Have you ever encountered challenges related to DRL library/framework usage? - How much effort was required to handle this challenge/issue 59 ⓘ

How much effort was required to handle this challenge/issue	Average	Minimum	Maximum	Count
Installation Challenges regarding installing/uninstalling relevant librari...	1.31	1.00	3.00	59
Depenedency challenges regarding mismatched versions of installed librarie...	1.31	1.00	3.00	59
API usage Challenges about the usage of arguments, attributes, methods, et...	1.31	1.00	3.00	59
Documentation When people want to use a feature of an DRL library/frameworkor...	1.36	1.00	3.00	59
Bugs inside frameworks Challenges which are related to the identified bugs...	1.46	1.00	3.00	59
Best fitted library for a special task When the developer is unsure about...	1.46	1.00	3.00	59

#### Have you ever encountered challenges related to parallel processing & multi-threading? - Q8#1 59 ⓘ



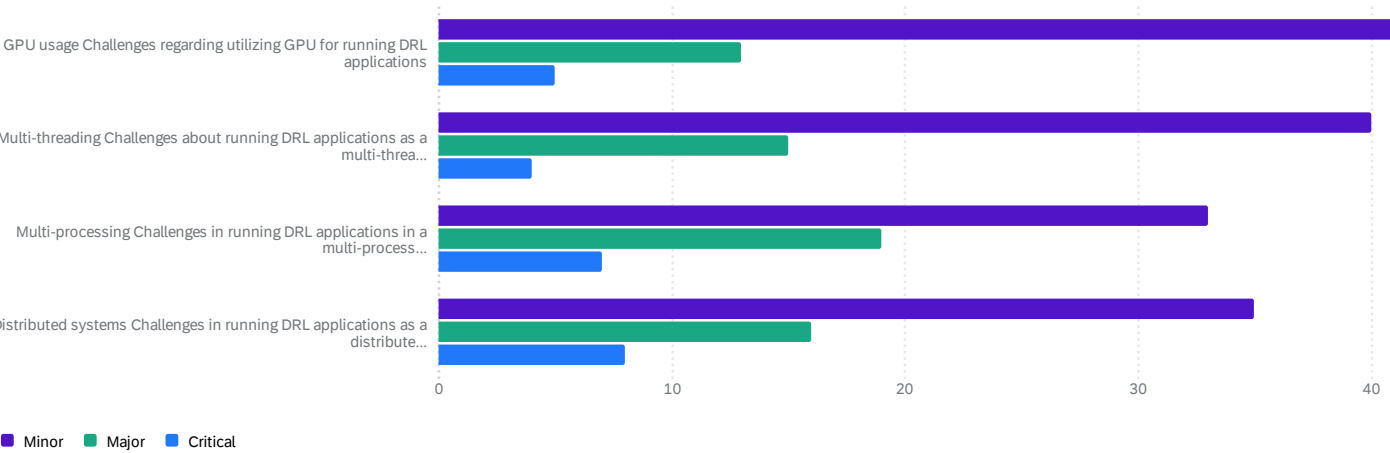
#### Have you ever encountered challenges related to parallel processing & multi-threading? - Q8#1 59 ⓘ

Q8#1	Yes	No
GPU usage Challenges regarding utilizing GPU for running DRL applications	33	26
Multi-threading Challenges about running DRL applications as a multi-threa...	27	32
Multi-processing Challenges in running DRL applications in a multi-process...	30	29
Distributed systems Challenges in running DRL applications as a distribute...	25	34

Have you ever encountered challenges related to parallel processing & multi-threading? - Q8#1 59 ⓘ

Q8#1	Average	Minimum	Maximum	Count
GPU usage Challenges regarding utilizing GPU for running DRL applications	1.44	1.00	2.00	59
Multi-threading Challenges about running DRL applications as a multi-threa...	1.54	1.00	2.00	59
Multi-processing Challenges in running DRL applications in a multi-process...	1.49	1.00	2.00	59
Distributed systems Challenges in running DRL applications as a distribute...	1.58	1.00	2.00	59

Have you ever encountered challenges related to parallel processing & multi-threading? - How severe was the challenge/issue 59 ⓘ



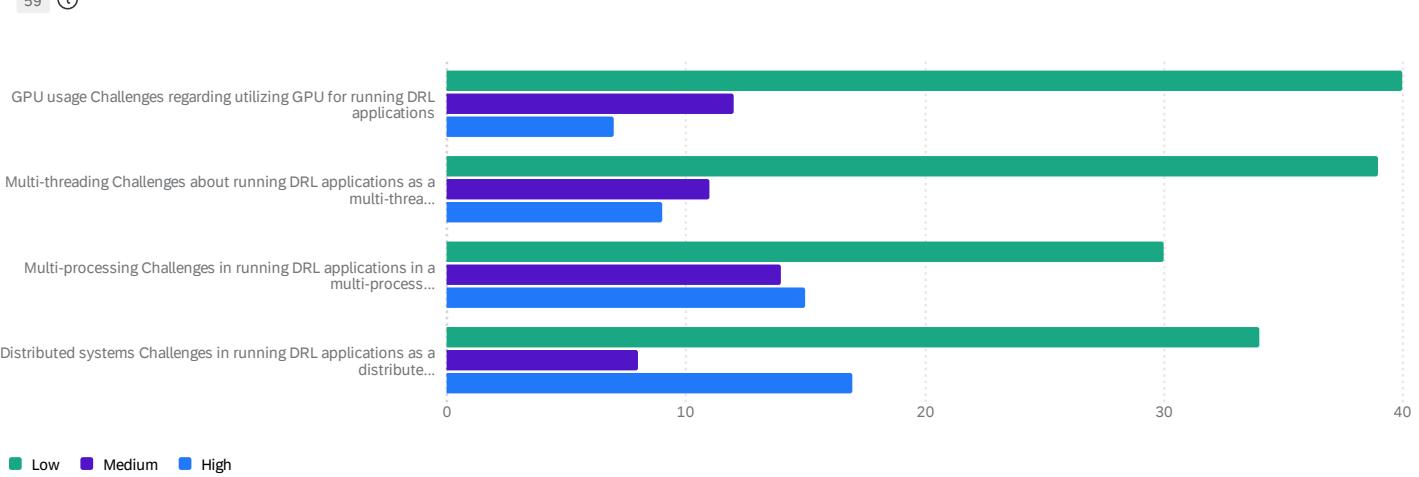
Have you ever encountered challenges related to parallel processing & multi-threading? - How severe was the challenge/issue 59 ⓘ

How severe was the challenge/issue	Minor	Major	Critical
GPU usage Challenges regarding utilizing GPU for running DRL applications	41	13	5
Multi-threading Challenges about running DRL applications as a multi-threa...	40	15	4
Multi-processing Challenges in running DRL applications in a multi-process...	33	19	7
Distributed systems Challenges in running DRL applications as a distribute...	35	16	8

Have you ever encountered challenges related to parallel processing & multi-threading? - How severe was the challenge/issue 59 ⓘ

How severe was the challenge/issue	Average	Minimum	Maximum	Count
GPU usage Challenges regarding utilizing GPU for running DRL applications	1.39	1.00	3.00	59
Multi-threading Challenges about running DRL applications as a multi-threa...	1.39	1.00	3.00	59
Multi-processing Challenges in running DRL applications in a multi-process...	1.56	1.00	3.00	59
Distributed systems Challenges in running DRL applications as a distribute...	1.54	1.00	3.00	59

Have you ever encountered challenges related to parallel processing & multi-threading? - How much effort was required to handle this challenge/issue 59 ⓘ



Have you ever encountered challenges related to parallel processing & multi-threading? - How much effort was required to handle this challenge/issue 59 ⓘ

How much effort was required to handle this challenge/issue	Low	Medium	High
GPU usage Challenges regarding utilizing GPU for running DRL applications	40	12	7
Multi-threading Challenges about running DRL applications as a multi-threa...	39	11	9
Multi-processing Challenges in running DRL applications in a multi-process...	30	14	15
Distributed systems Challenges in running DRL applications as a distribute...	34	8	17

Have you ever encountered challenges related to parallel processing & multi-threading? - How much effort was required to handle this challenge/issue

59 ⓘ

How much effort was required to handle this challenge/issue	Average	Minimum	Maximum	Count
GPU usage Challenges regarding utilizing GPU for running DRL applications	1.44	1.00	3.00	59
Multi-threading Challenges about running DRL applications as a multi-threa...	1.49	1.00	3.00	59
Multi-processing Challenges in running DRL applications in a multi-process...	1.75	1.00	3.00	59
Distributed systems Challenges in running DRL applications as a distribute...	1.71	1.00	3.00	59

Have you ever encountered challenges related to DL knowledge? - Q9#1 59 ⓘ



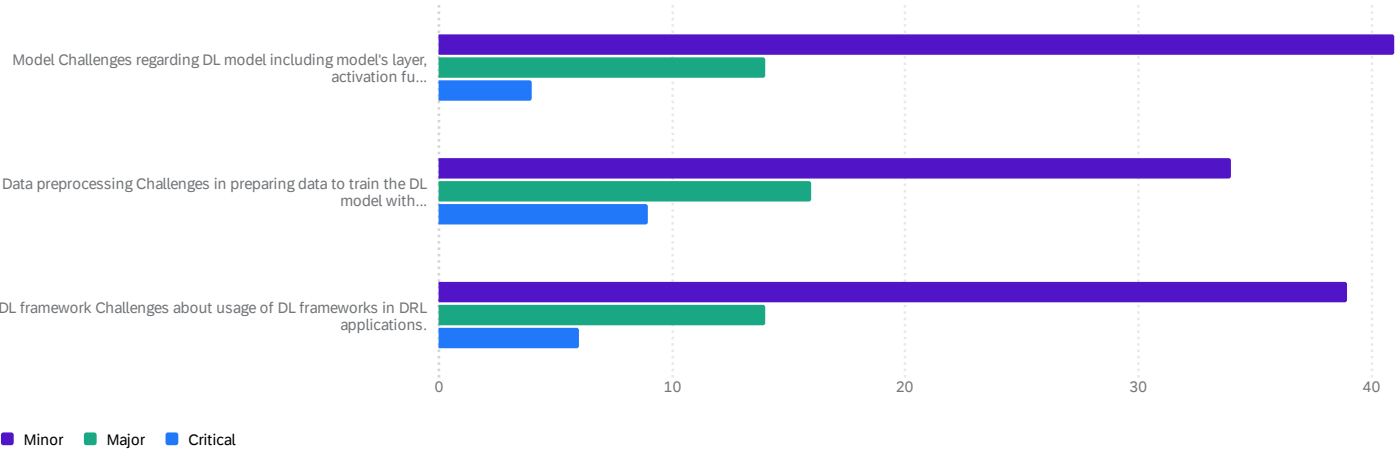
Have you ever encountered challenges related to DL knowledge? - Q9#1 59 ⓘ

Q9#1	Yes	No
Model Challenges regarding DL model including model's layer, activation fu...	30	29
Data preprocessing Challenges in preparing data to train the DL model with...	29	30
DL framework Challenges about usage of DL frameworks in DRL applications.	27	32

Have you ever encountered challenges related to DL knowledge? - Q9#1 59 ⓘ

Q9#1	Average	Minimum	Maximum	Count
Model Challenges regarding DL model including model's layer, activation fu...	1.49	1.00	2.00	59
Data preprocessing Challenges in preparing data to train the DL model with...	1.51	1.00	2.00	59
DL framework Challenges about usage of DL frameworks in DRL applications.	1.54	1.00	2.00	59

Have you ever encountered challenges related to DL knowledge? - How severe was the challenge/issue 59 ⓘ



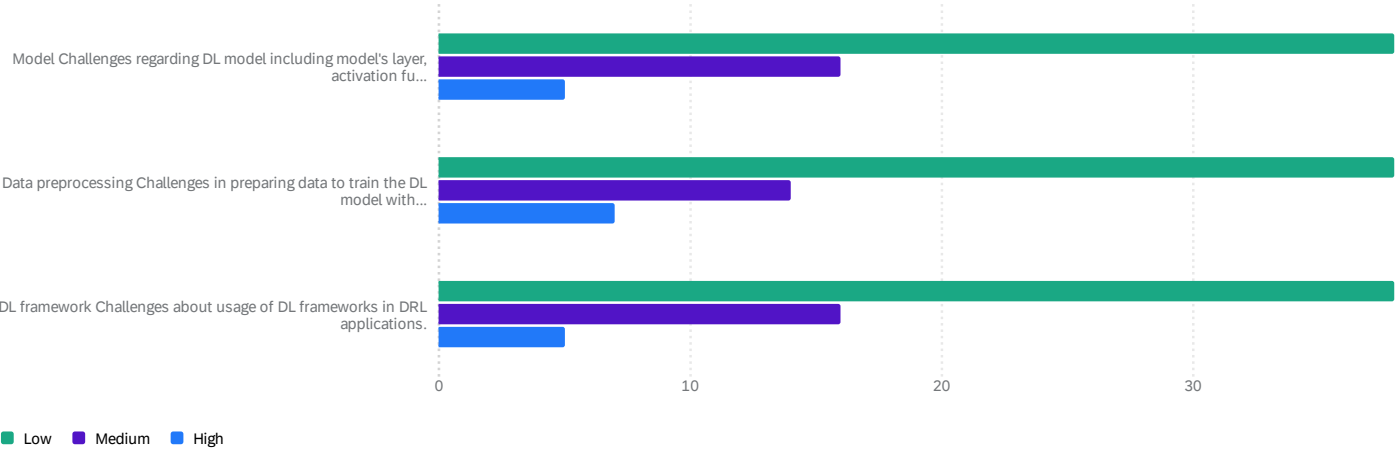
Have you ever encountered challenges related to DL knowledge? - How severe was the challenge/issue 59 ⓘ

How severe was the challenge/issue	Minor	Major	Critical
Model Challenges regarding DL model including model's layer, activation fu...	41	14	4
Data preprocessing Challenges in preparing data to train the DL model with...	34	16	9
DL framework Challenges about usage of DL frameworks in DRL applications.	39	14	6

Have you ever encountered challenges related to DL knowledge? - How severe was the challenge/issue 59 ⓘ

How severe was the challenge/issue	Average	Minimum	Maximum	Count
Model Challenges regarding DL model including model's layer, activation fu...	1.37	1.00	3.00	59
Data preprocessing Challenges in preparing data to train the DL model with...	1.58	1.00	3.00	59
DL framework Challenges about usage of DL frameworks in DRL applications.	1.44	1.00	3.00	59

Have you ever encountered challenges related to DL knowledge? - How much effort was required to handle this challenge/issue 59 ⓘ





Have you ever encountered challenges related to DL knowledge? - How much effort was required to handle this challenge/issue 59 ⓘ

How much effort was required to handle this challenge/issue	Low	Medium	High
Model Challenges regarding DL model including model's layer, activation fu...	38	16	5
Data preprocessing Challenges in preparing data to train the DL model with...	38	14	7
DL framework Challenges about usage of DL frameworks in DRL applications.	38	16	5

Have you ever encountered challenges related to DL knowledge? - How much effort was required to handle this challenge/issue 59 ⓘ

How much effort was required to handle this challenge/issue	Average	Minimum	Maximum	Count
Model Challenges regarding DL model including model's layer, activation fu...	1.44	1.00	3.00	59
Data preprocessing Challenges in preparing data to train the DL model with...	1.47	1.00	3.00	59
DL framework Challenges about usage of DL frameworks in DRL applications.	1.44	1.00	3.00	59

Have you ever encountered any challenges/issues related to DRL that have not been mentioned in this survey? If yes, could you please describe them? ⓘ

Train in simulation, and deploy in the real world enviroment

Another very important challenge is to adapt an existing environment/game for a DRL framework: if the environment is not created with the intention of using it for DRL, adapting it to this framework (e.g. make the env asking for a request, wait until the net has a response, batch observations in case of multi-agent env, etc..) is a very critical challenge, that requires a very high level of effort and knowledge to solve.

Reward function drift, unstable learning due to shifts in data distributions, and more costly (time and expenses) to train a DRL agent compared to supervised learning.

Maybe is mentioned, but I want to add the problem of when is better to use off policy vs on policy algorithms

Industrial application, tendency

Redesigning problems to fit the (PO)MDP formulation can often be a struggle when working with folks that are fairly rigid about how they view the problem. This is mostly only an issue with critical controls tasks.

I work with highly random data that is hard for agents to learn. Finding features is difficult

The challenge related to Mujoco. Since DeepMind bought Mujoco and made it open source, there has been major challenges that requires high effort to design new projects with the open source Mujoco, especially when you start a new project and want to use some old codes (or old repositories) using older version of Mujoco.

Yes, Training - To realize when to stop training to efficient result

No, the survey covers all DRL topics well.

Local optimization methods, such as stochastic gradient descent, find a local optimum. Thus, when optimising multiple times, one can obtain different solutions. Analyzing the (quality) of solutions has been a challenge.

Practical applications such as robots or speficic device for control are important problem for RL, cause the only RL exist in book or simulation, it cannot attract more researchers and funding for RL. So I think sim-to-real, or pre-trained model learned by RL is important for future work.

Default parameters used in common libraries are just wrong so comparing evaluations by default results in inaccuracies that authors don't report , OR authors paper conflicts with his code and now there's 2 "valid" implementations floating around of this model, the one they released, and the one they discussed in the paper, and they can sometimes be hugely different in terms of implications, even though they both achieve similar results usually.

- Lack of active exploration capabilities in most DRL algorithms, beside random exploration which is not enough for some domains. (thus this does not fit the existing "Hyperparameters Tuning" category even though it mentions exploration, since no amount of tuning the epsilon decay or gaussian noise would fix the issue) - sim 2 real gap for applied DRL.I guess this kind of falls into the reward/environment categories, but sometimes the world is too complex/slow to be efficiently AND accurately approximated anyway, so robustness/transfer is required - difficulty in interpreting the logs and diagnosing which part of all the RL machinery is broken (reward training? value training? policy training? representation? exploration? something else?)

no other challenges/issues encountered

How to optimize models to run in GPUs, and when this is best. We have found that sometimes CPUs run RL code faster than GPU, and we were uncertain as to why this was happening.

Model interpretability may require domain expertise.

Best wishes for your research

rlilb is the worst RL library for research

I often answered with "NO" due to the lack of experience in DRL. I only did a few learning projects with it and took a few month part of at a project at work. Most problems where Hyperparameter-Tuning ... tried to solve it automatically with Ray-Tune or other Tools. Why do I write this comment? I hope you can better classify my answers with this background information.

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the design of the state space took me a lot of time, when testing new methods and mixing them with some different methods

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Thank you for contacting me to survey the DRL. I am learning from many excellent studies by many DRL researchers.

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Authors of RL papers deliberately make their math obtusely confusing when the entire mathematical framework for RL has been generalized for decades, this makes papers harder to follow but they think it makes them sound smart. other comments: why would you make the survey like this lol it's so unnecessarily confusing, if I answer no I still have given answers to the other questions? this isn't that hard come on now.

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I focus on application of DRL algorithms and biggest usage of time is figuring out the "optimal" way to create a customized environment, how to represent the state-action space, and how to describe non-sparse rewards such that the agent learns a behaviour that is aligned with the objective.

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While there are many tutorials to start working on RL, a few issues are shared between many. 1. Diversity- researchers use RL in different domain. However, many tutorials cover the RL for a very specific domain/application. For example, many tutorials use Cart Pole as their example. But, different researchers might like to see more serious examples related to their field. 2. Hands-on- Broadly speaking, machine learning and deep learning tutorials are distinguished between two themes: 1. Research-based and 2. development-based. Tutorials from category one cover a wide range of background that is needed to learn ML/DeepL in depth. The second category focuses on teaching how to use the existing techniques without having to learn the mathematical background. Doing so, they help their audience spend their time only as much as required for their purpose. However, many RL tutorials combine some background knowledge with hands-on, which often leads to these two undesirable situations: 1- they cover none of the background and hands-on in depth and with variety 2- audiences have to spend a lot of time to read things that may not be necessary for their purpose

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RL is hard! :)

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I didn't use parallel processing & multi-threading in my DRL research...

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As mentioned in the dependency section, the most frustrating part of working with RL currently is all the breaking API changes. Especially with gym(nasium) consistently changing their API it effects all the downstream libraries.

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