Few Sample Learning without Data Storage For Lifelong Stream Mining

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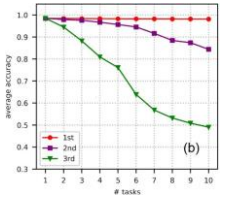
Lifelong Learning for Stream:

The model would perform learning on infinity tasks/classes during the stream processing, makes it continually adapt as the environment changes or new concepts emerged.

Challenge:

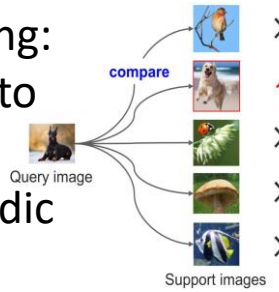
1. The model should learn novel concepts with limited annotated data (sample efficiency.)
2. The model should preserve old knowledge without accessing to previous task/category, and maintain data privacy, memory restriction.



catastrophic forgetting

Solution:

1. Few-sample learning: make the model learn to compare different categories in the episodic training mechanism:



× If a model can determine the
√ similarity of two
× images, it can
× classify an unseen
× input image
to the (few)
labeled instances

2. No Storage: apply conditional adversarial generative model to learn a mapping function, which could produce the samples that matches the real distribution from old categories.