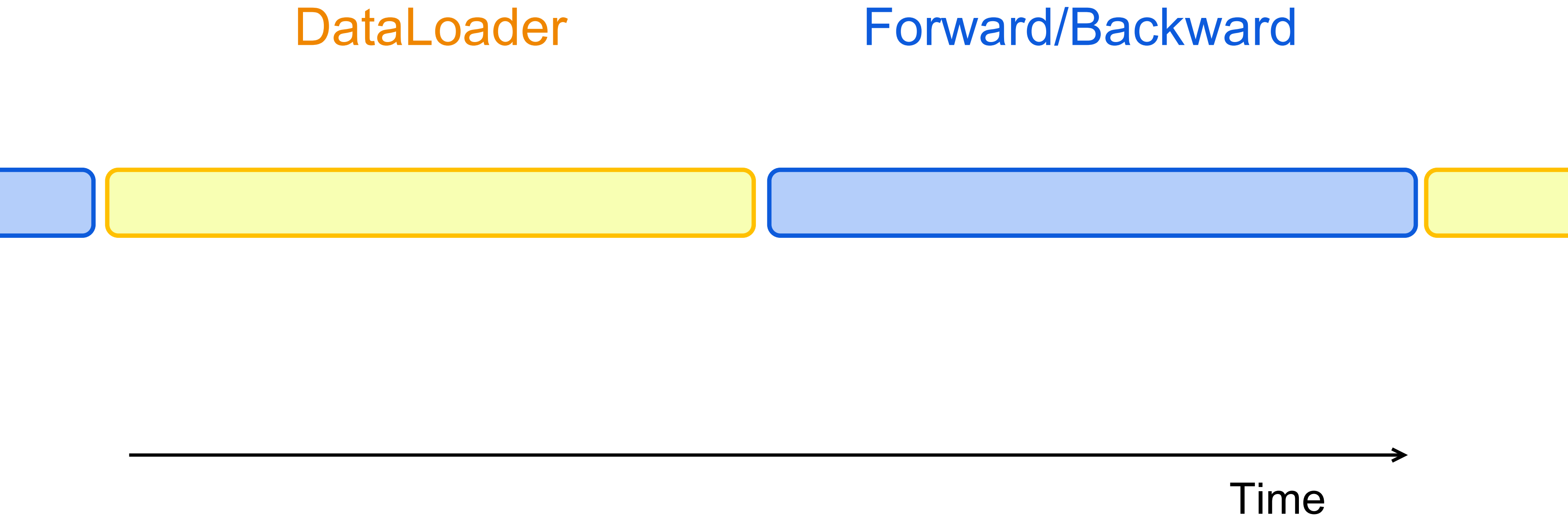
Deep Learning Optimisé - Jean Zay

Conclusion

INSTITUT DU DÉVELOPPEMENT ET DES RESSOURCES EN INFORMATIQUE SCIENTIFIQUE

Conclusion

Synchronous : num_worker = 0



DataLoader

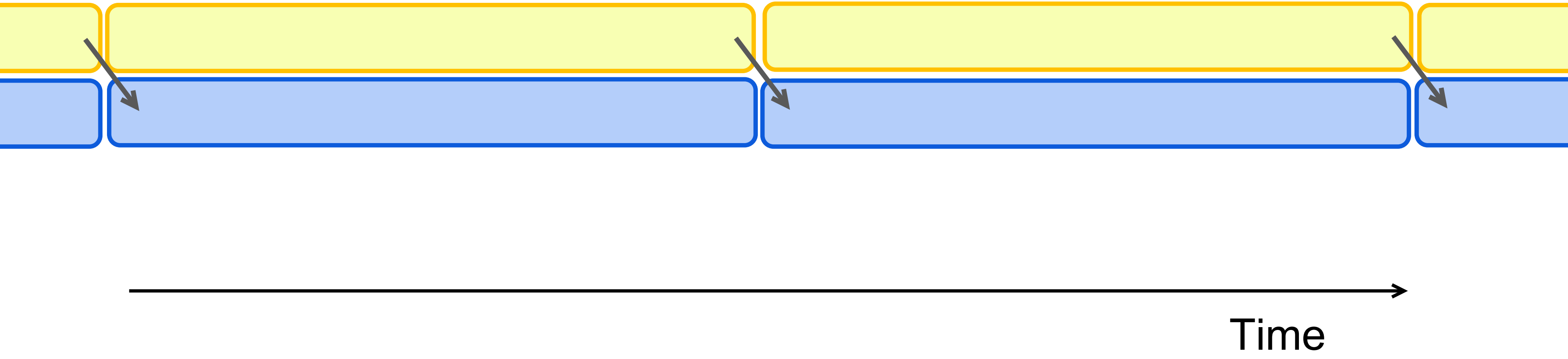
Forward/Backward

Conclusion

Asynchronous : num_worker > 0

DataLoader

Forward/Backward



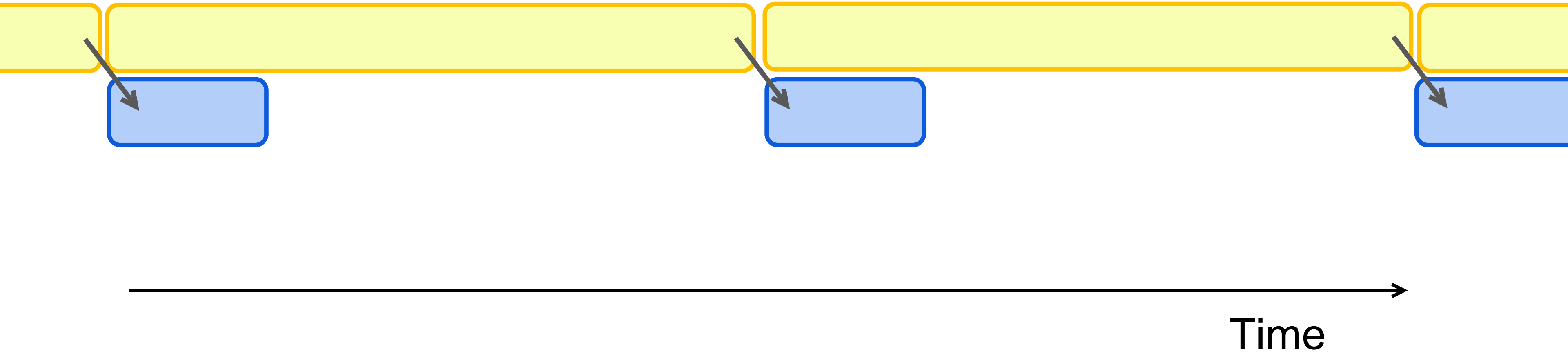
Time

Conclusion

GPU Computing, Mixed Precision, torch.compile, ...

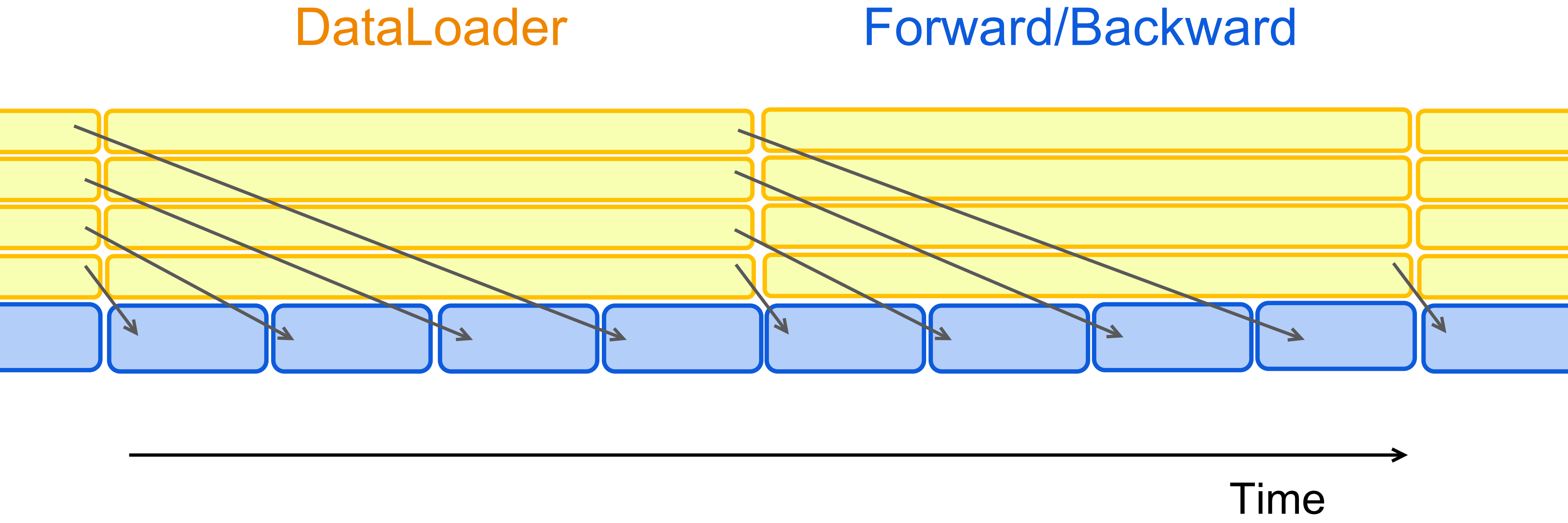
DataLoader

Forward/Backward



Conclusion

DataLoader Optim. : num_worker > 1, ...



Conclusion

Training take too long !!!

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Increase your batch size

Conclusion

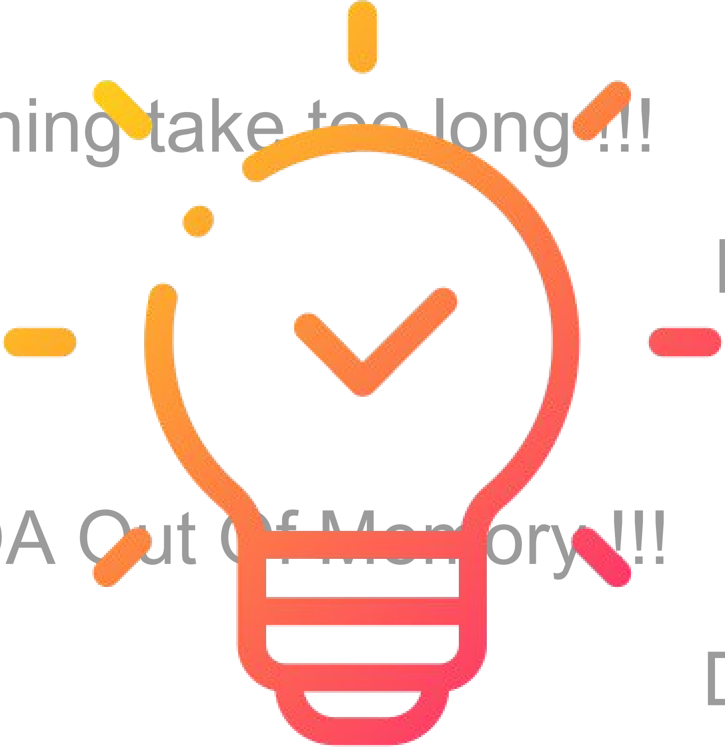
Training take too long !!!

Increase your batch size

CUDA Out Of Memory !!!

Decrease your batch size

Conclusion



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Conclusion

For Small Model !!!

10s or 100s M Params

Distributed Data Parallelism

Conclusion

For Small Model !!!

10s or 100s M Params

Distributed Data Parallelism

⚠ → Large Batch !!

Conclusion

SGD AdamW

Weight Decay

LARS

LAMB

Batch Scheduler

LR Scheduler

Warmup LR scaling LR Decay

Conclusion

For Large Model !!!

> 1G Params

ZeRO

FSDP

Model Parallelisms

Pipeline Parallelism

Tensor Parallelism