Deep Learning Optimisé - Jean Zay

Conclusion

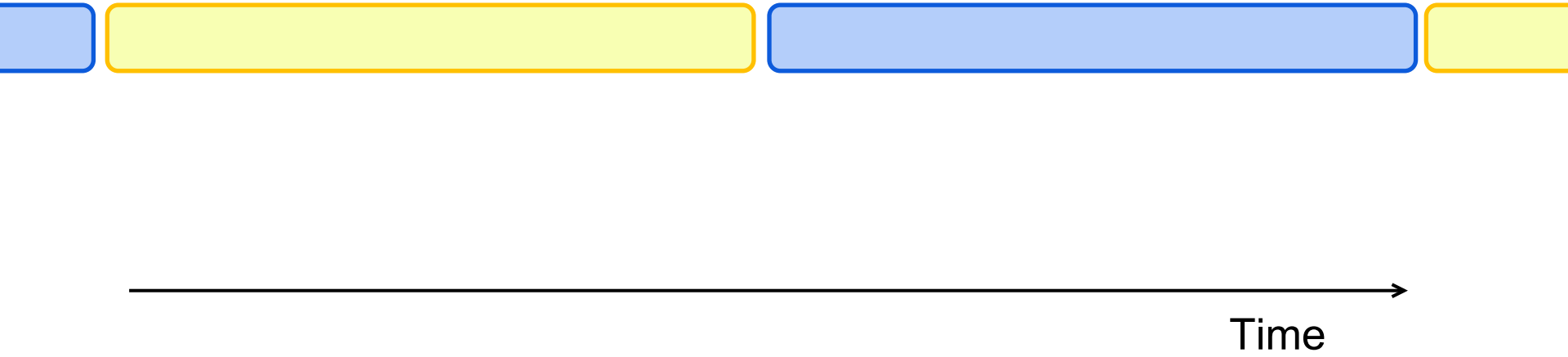
INSTITUT DU
DÉVELOPPEMENT ET DES
RESSOURCES EN
INFORMATIQUE
SCIENTIFIQUE

Conclusion

Synchronous : num_worker = 0

DataLoader

Forward/Backward

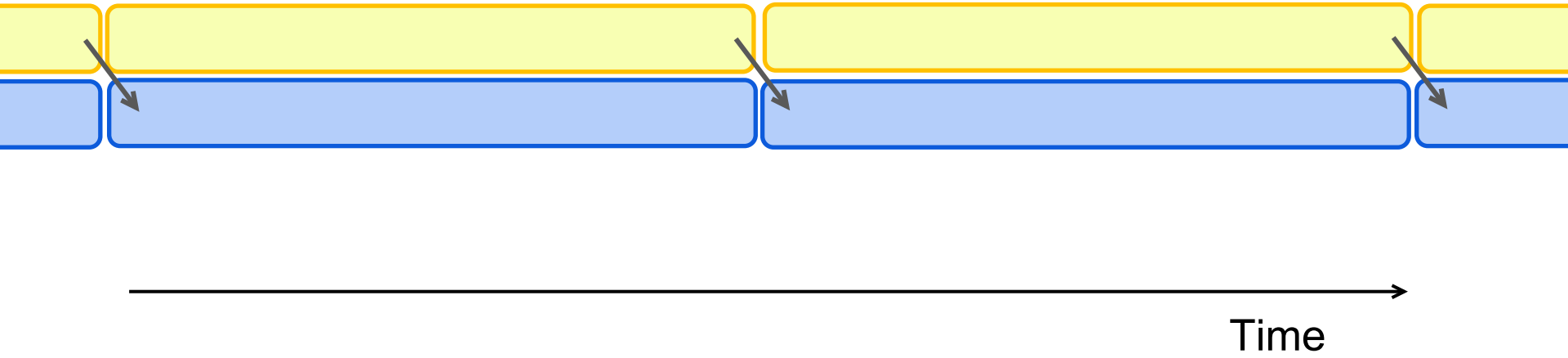


Conclusion

Asynchronous : num_worker > 0

DataLoader

Forward/Backward

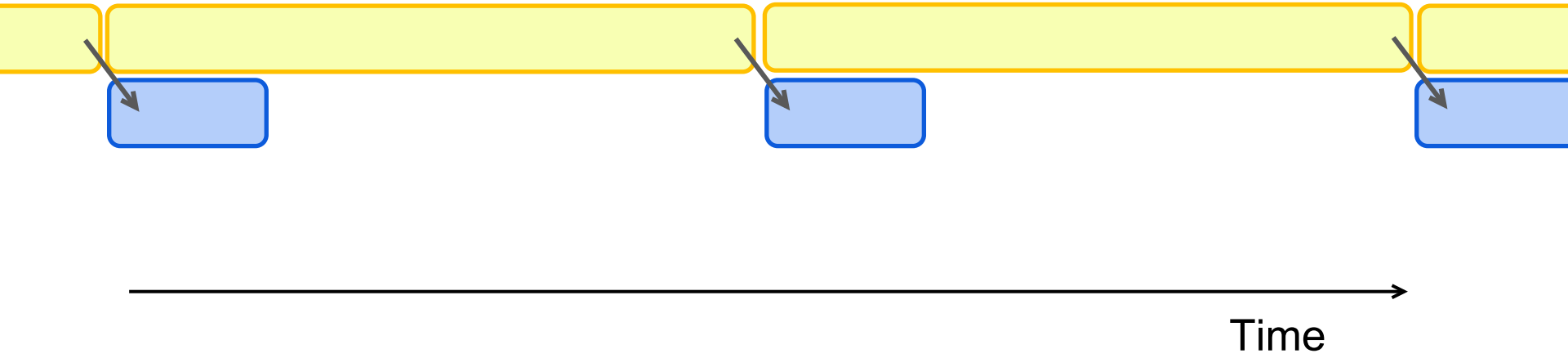


Conclusion

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

DataLoader

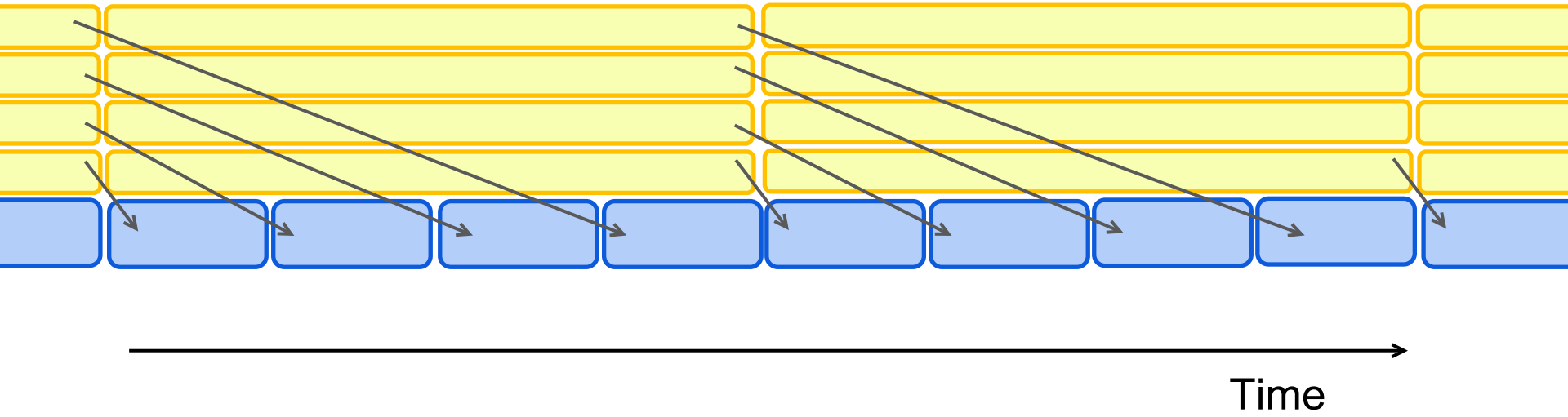
Forward/Backward



Conclusion

DataLoader Optim. : num_worker > 1, ...

DataLoader Forward/Backward



Conclusion

Training take too long !!!

Increase your batch size

Conclusion

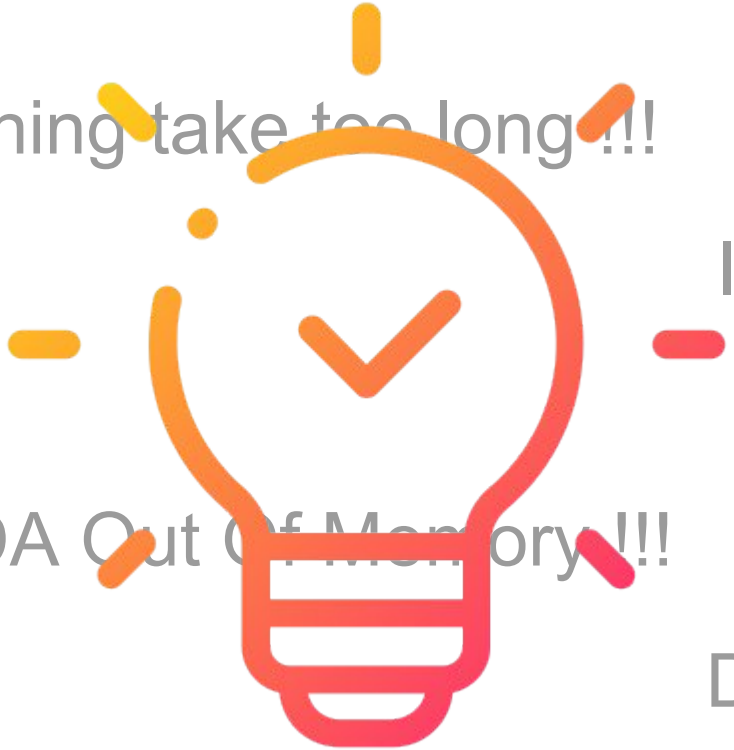
Training take too long !!!

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

Data Parallelism

Conclusion

For Small Model !!!

10s or 100s M Params

Data Parallelism

⟹ Large Batch !!

Conclusion

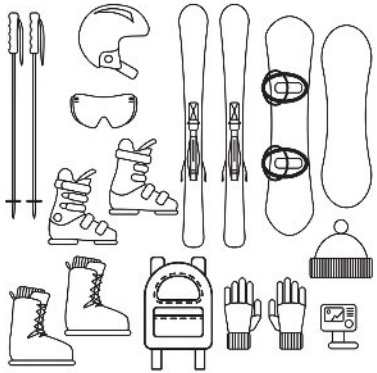
SGD AdamW

Weight Decay

LARS

LAMB

Batch Scheduler



LR Scheduler

LR scaling

Warmup LR Decay

Conclusion

For Large Model !!!

> 1G Params

Model Parallelisms

Pipeline Parallelism

Tensor Parallelism

ZeRO

FSDP

HSDP