

# Implementing your SasModels in Futhark

It goes much faster

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## **Main reasoning behind writing models in Futhark**

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# What languages can we model in?

- Current sasview models are implemented in either pure Python (a programming language)
- .. or in OpenCL (much faster than Python)
- But should be written in Futhark (much faster than OpenCL!)

# Why is Futhark faster?

- Independent (accumulating) for-loop iterations can easily\* be rewritten as as map/reduce operations.
- The Futhark language uses a heavily optimizing compiler, that rewards map/reduce patterns with major performance increases.
- (In case of basic Python implemented models, it's trivial to make them go faster.)

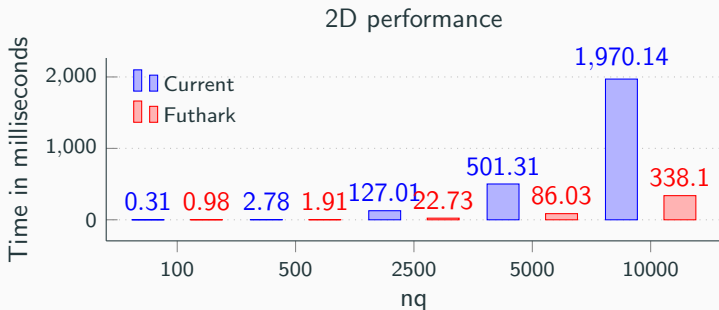
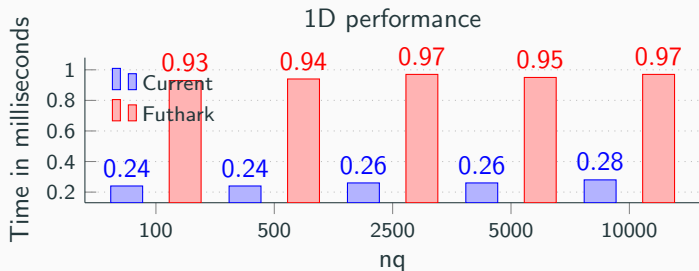
# Porting an OpenCL model to Futhark

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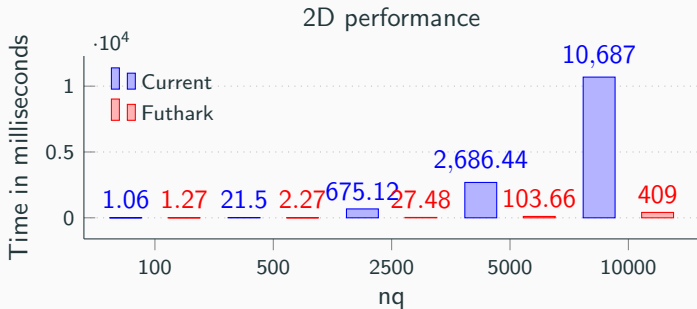
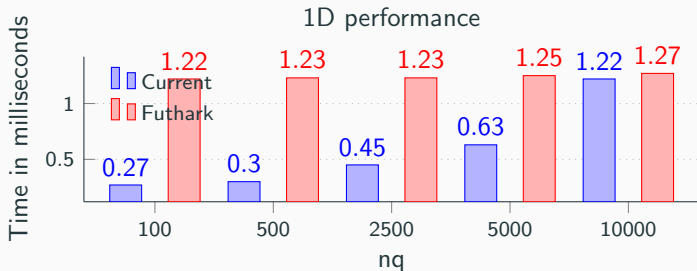
# Performance

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# Average eval time for Line (trivial Python model)

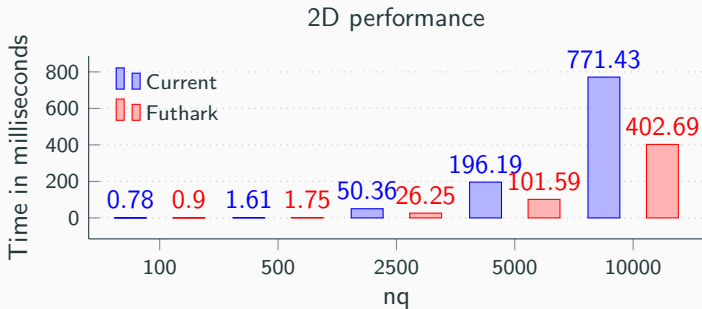
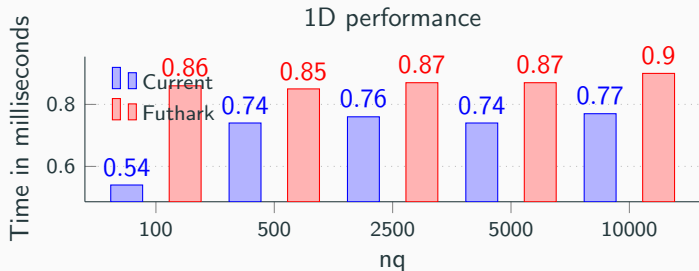


# Average eval time for Broad Peak (Python model)

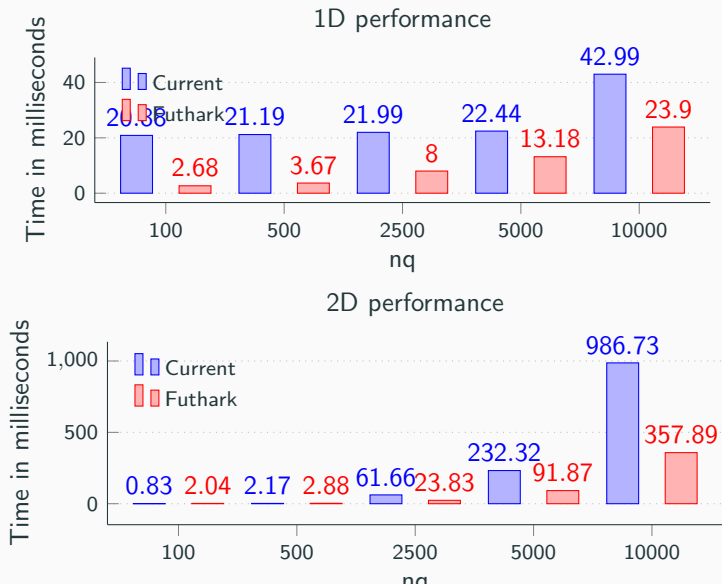




# Average eval time for DAB (trivial OpenCL model)



# Average eval time for core shell parallelepiped (OpenCL model)



**Questions?**

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