waveCUDA: A new CUDA-accelerated R package for wavelet analysis

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Outline

Purpose of waveCUDA

- Performing CUDA-accelerated wavelet analysis

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- I want to be able to do wavelet analysis more quickly in R!

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Good books on wavelets are (Nason, 2008) and (Percival & Walden, 2000).

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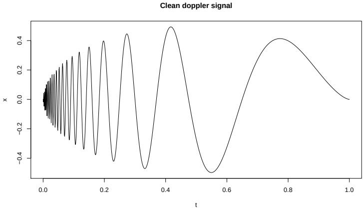

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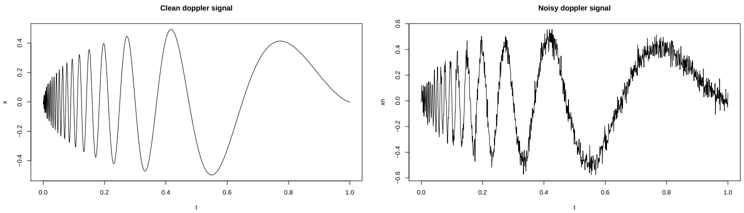

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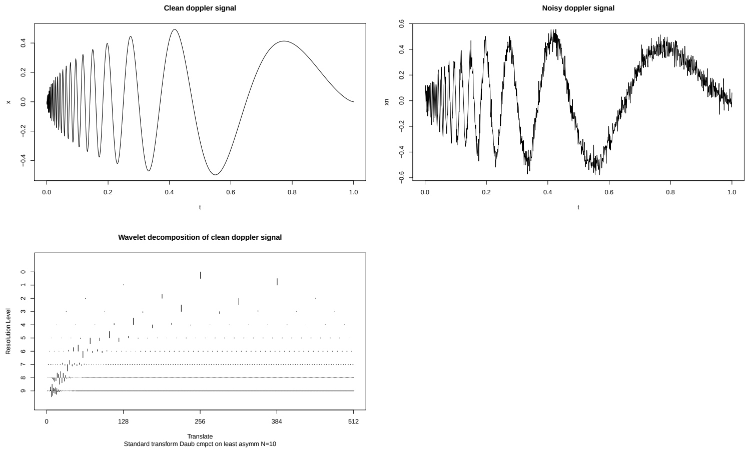

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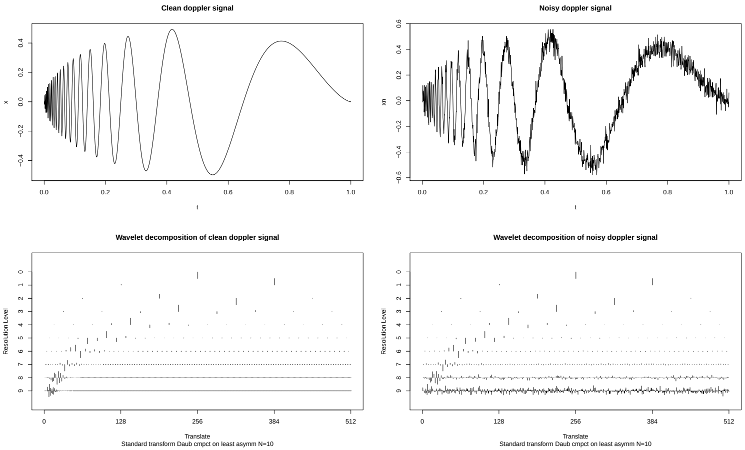

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	Intel i7-3740QM CPU	**NVIDIA GeForce 650M GPU**
Cores	4	384
RAM	16GB	2GB
Cache	6MB	256KB
Clock speed	2.7 GHz	0.83GHz
Max memory bandwidth	25.6GB/s	80GB/s

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- Optimisations used - shared memory, block size, fiddly kernels performing multiple layers of transform
- What has been implemented so far: Haar, Daubechies 4, thresholding, cross-validation

Speedups

I can do a live demo! Wish me luck...

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Requirements:

- nVidia CUDA-capable GPU
- CUDA 5.5
- Linux

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- Other wavelet transforms
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  - 2D transform - even bigger speedups

Interest

Are you interested in this package? (rhetorical question that doesn't need answering now)
Email wavecuda@imperial.ac.uk if you would like to be updated when it is uploaded onto CRAN.

Acknowledgements

We are very grateful to BP for providing funding for this research.

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