

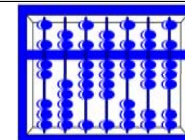
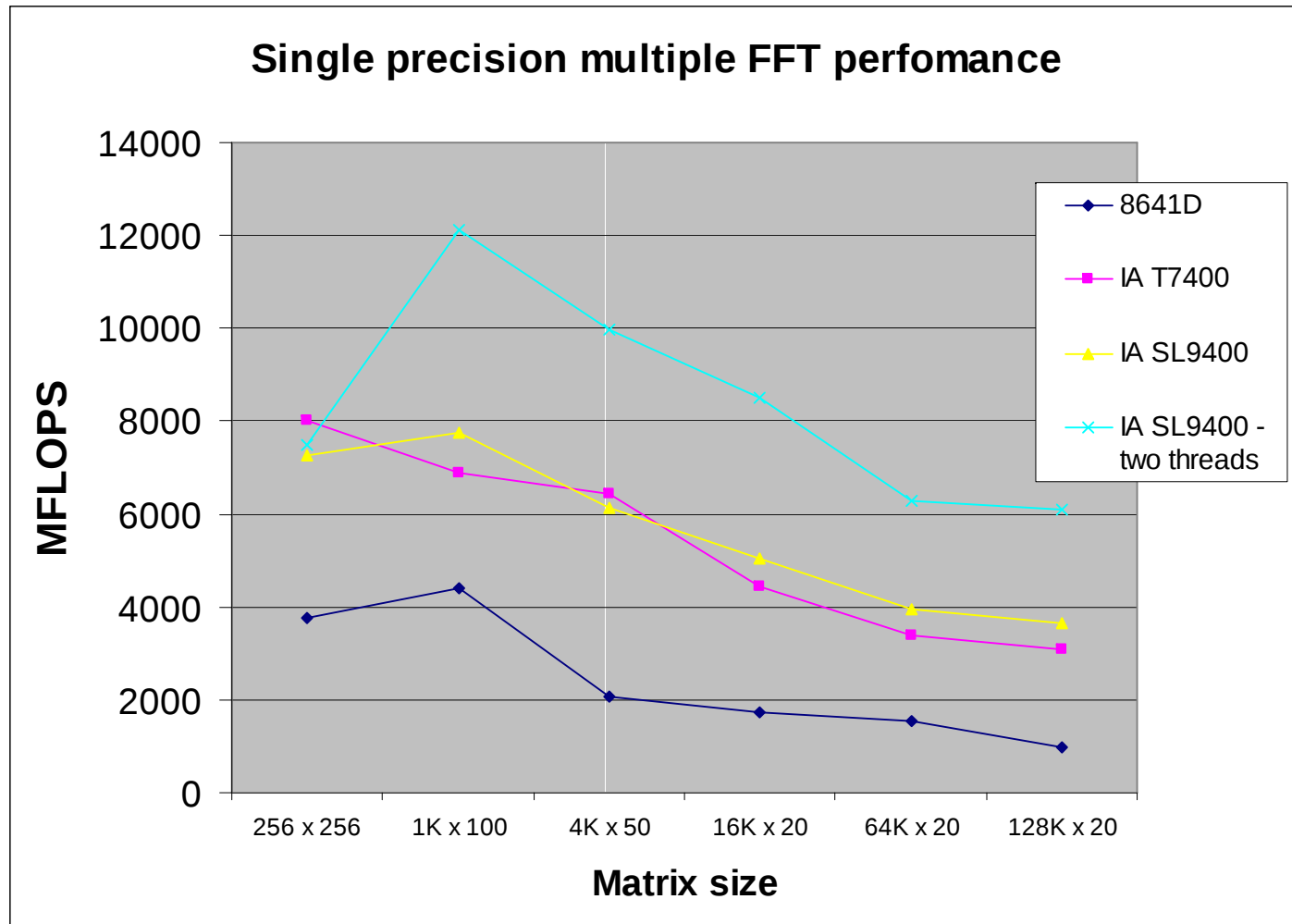
Dave Murray: **Developing Fast DSP Libraries for Advanced Processors**

- DSP libraries need to be efficient
- Efficiency is expensive to achieve
- Liberator is our tool for minimising development expense while maximising efficiency. It targets processors with a SIMD capability
- **Everything that can be automated is done by Liberator**
- We do the rest by hand

Liberator Factorises libraries into four levels:

- **API:** how the routines will be called. Current APIs: **Full VSIPL (including double precision); CSIPL (a “plain C” lookalike); FFTW; several proprietary APIs.**
- **Algorithm description:** including multi-algorithms for efficiency in varying situations
- **Code Generation:** Packages data into vectors; handles edge effects; performs multithreading; blocks the data; unrolls loops; prefetches when that's helpful; manages cache; handles edge effects (data size not a multiple of SIMD length); handles unaligned and strided data.
- **Processor-dependent back end:** Needs to handle only MIMD-sized vectors. We have back ends for PPC/G4; Intel/SSE; MIPS64

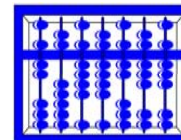
Example Performance Figures: multiple FFTs (N by N)



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For more details:

- See our poster
- Chat to me (Dave Murray)
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