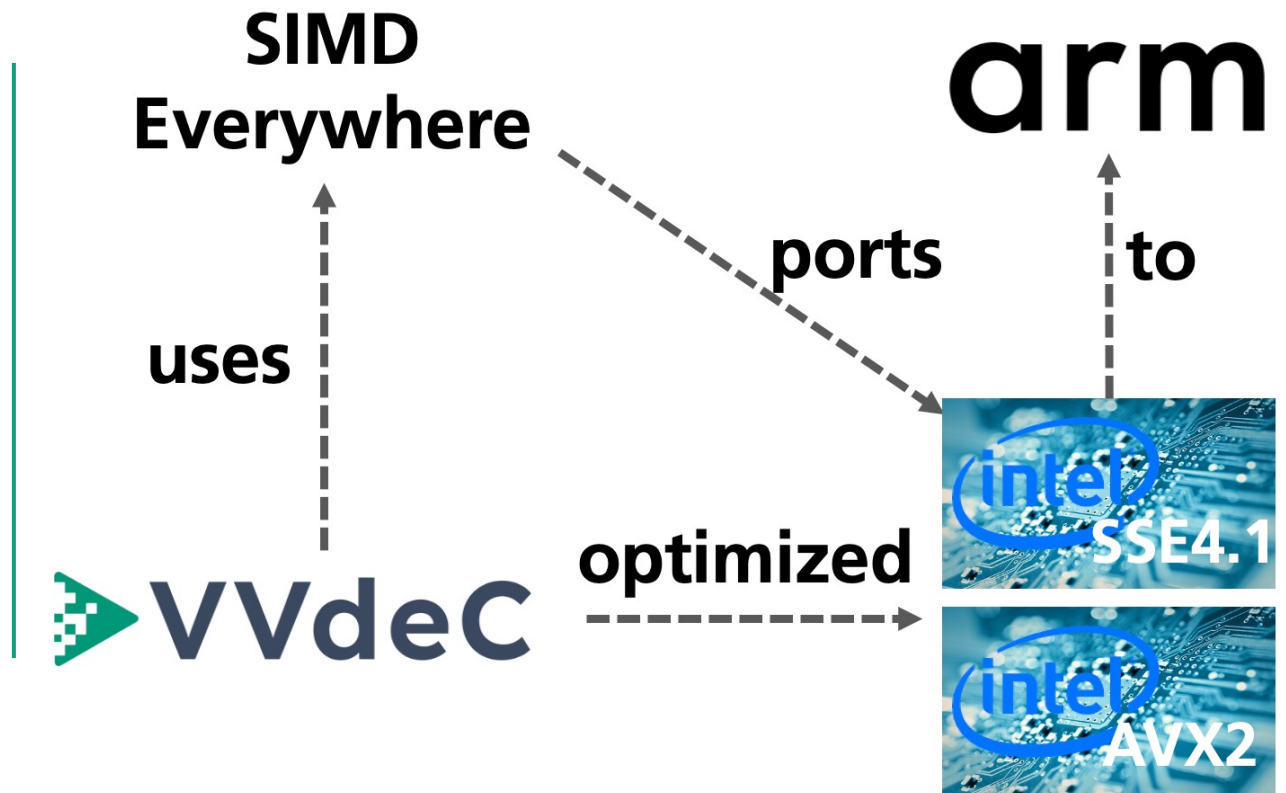


Optimizing an open source VVC decoder for Arm architectures

Florian Eisenreich

Starting point

- VVdeC is optimized for SSE4.1 and AVX2
- VVdeC uses the open-source project SIMD Everywhere (SIMDe)
 - ports SIMD intrinsics to non-native architectures

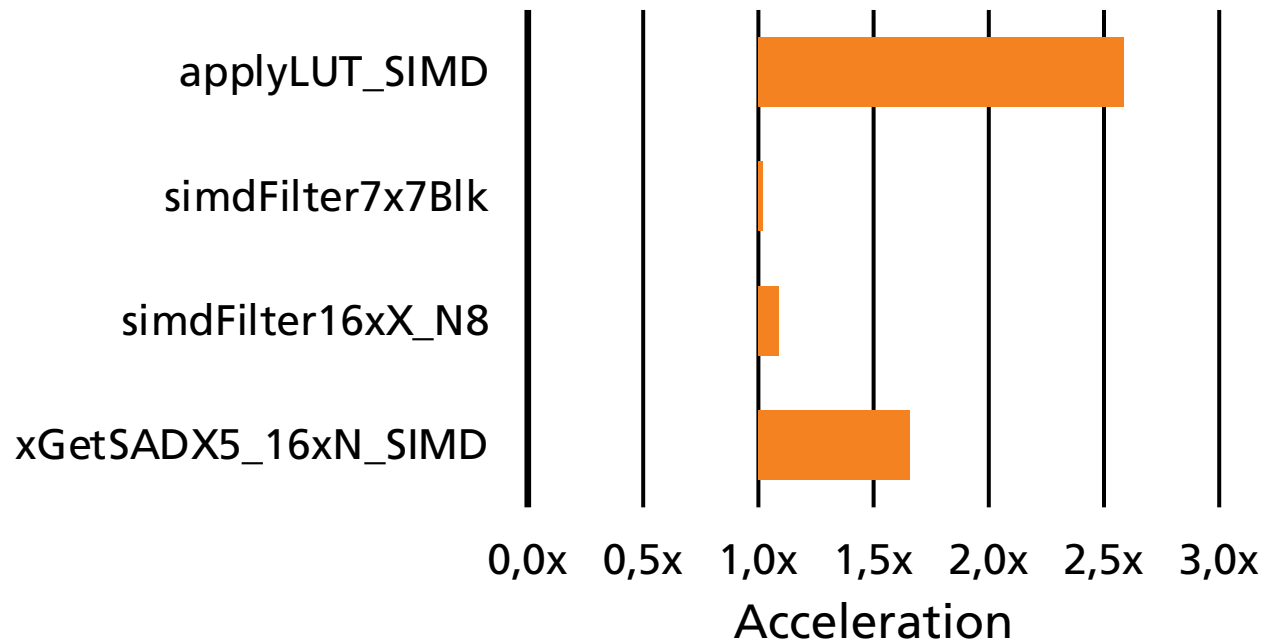


Identifying hotspots

- Profiling VVdeC using Instruments
 - Identify most time consuming functions
 - Arm vs. x86 performance
 - SISD vs. SIMD performance
-
- Optimize the 4 most promising functions

Results

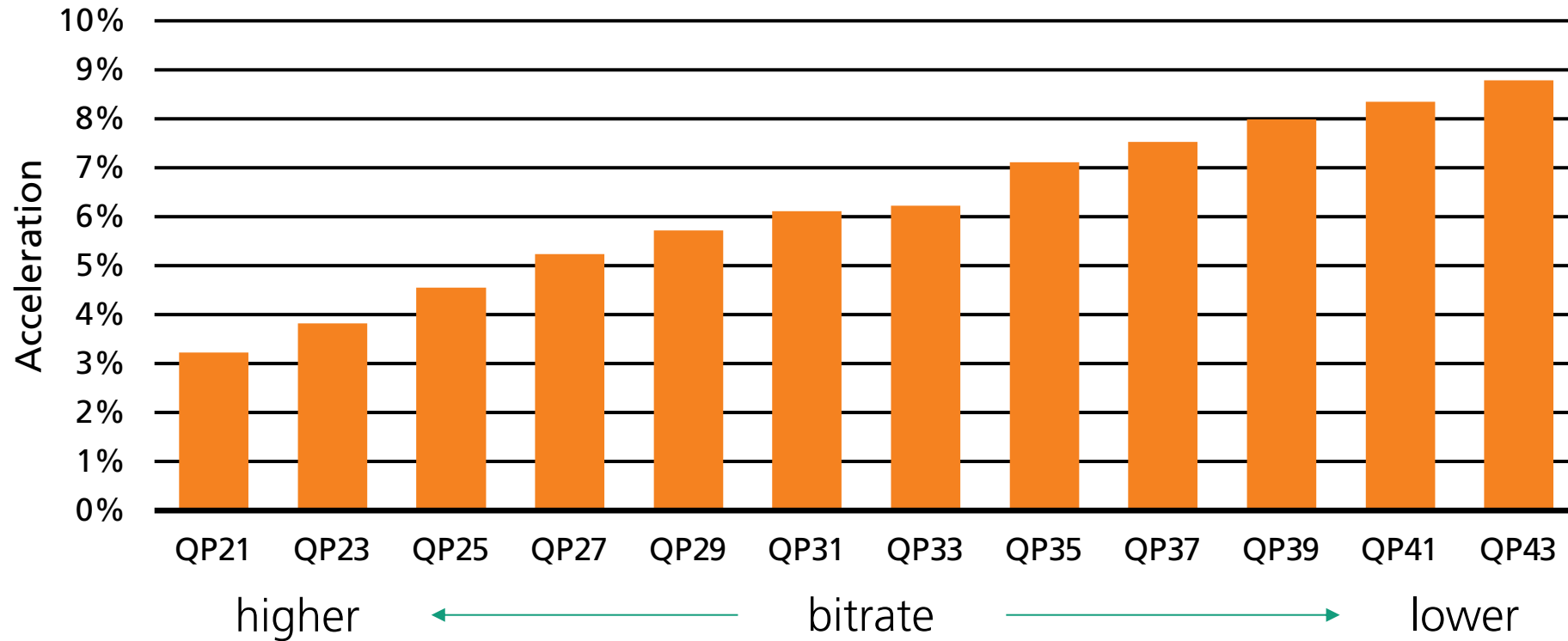
Acceleration of optimizations for
DaylightRoad2, QP43



- Shows manual optimization vs. SIMD
- Optimization is done with C-intrinsics
 - `<arm_neon.h>` library
- SIMD does a decent job

Results

Average acceleration of 11 JVET video sequences for different QP's

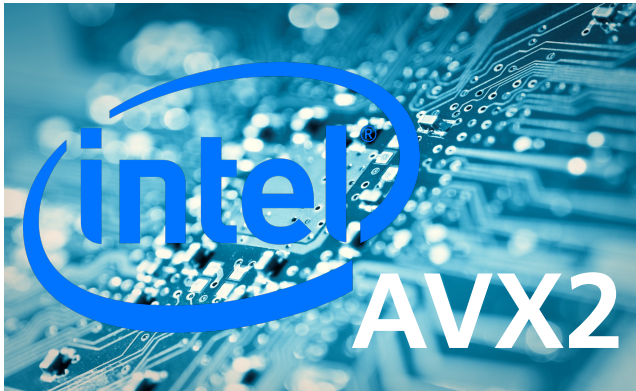


Further Work

Done

Ongoing

Future work

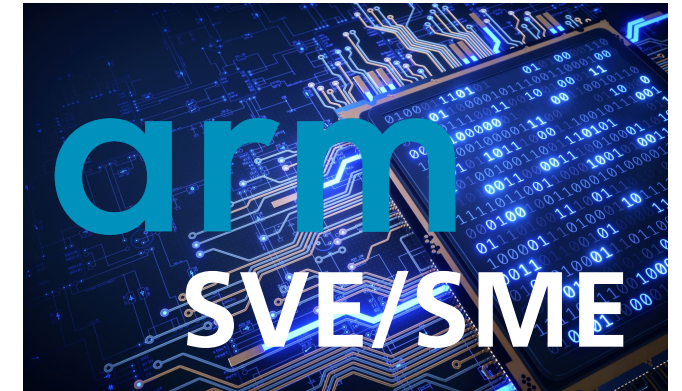


Integrate + optimize SIMD_e
AVX2 implementations

➤ [Led to a contribution to SIMD_e \(PR #1123\)](#)



Repeat the optimization
for VVenC



Optimization for
Arm SVE/SME