Huddly







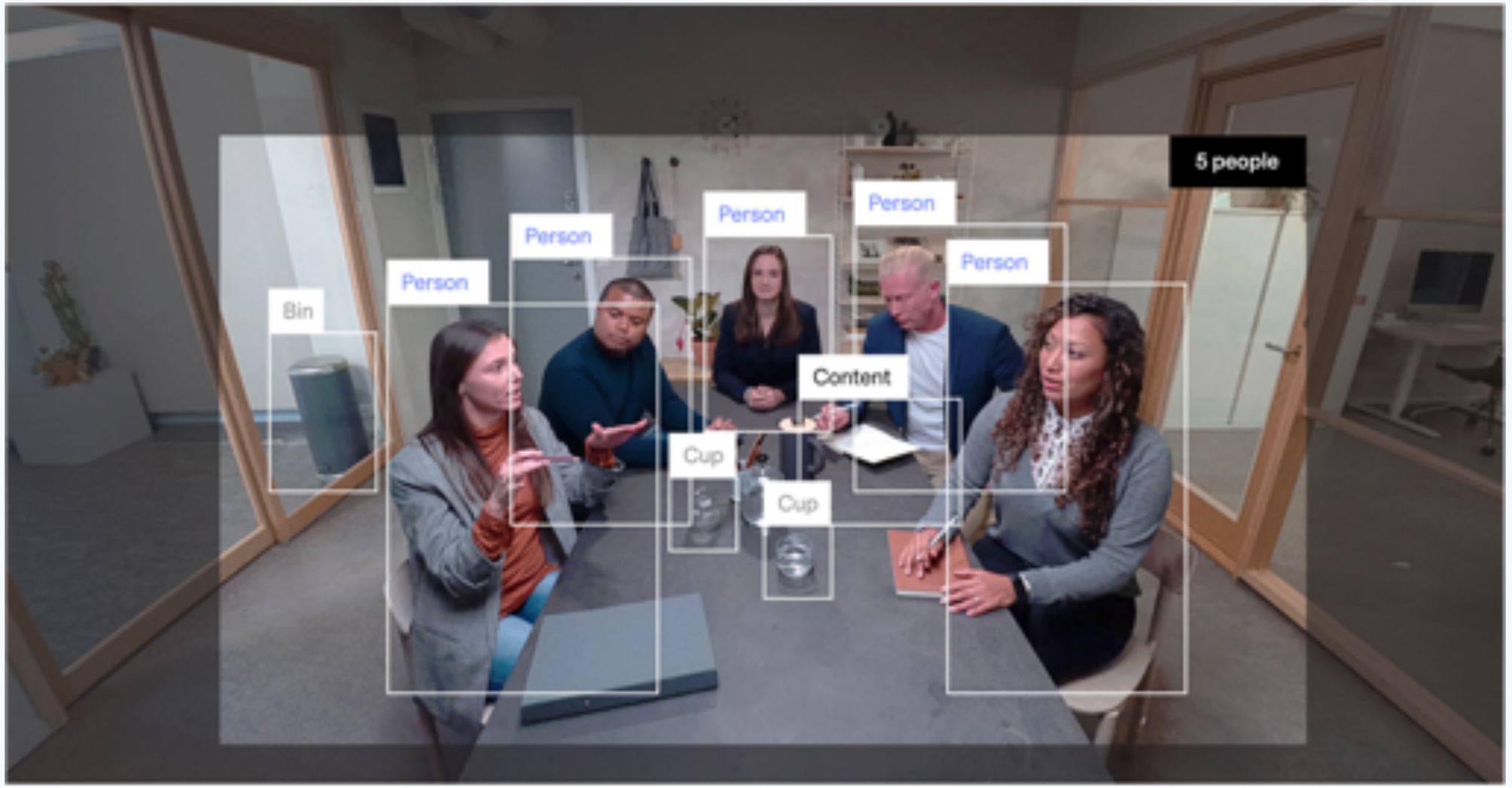






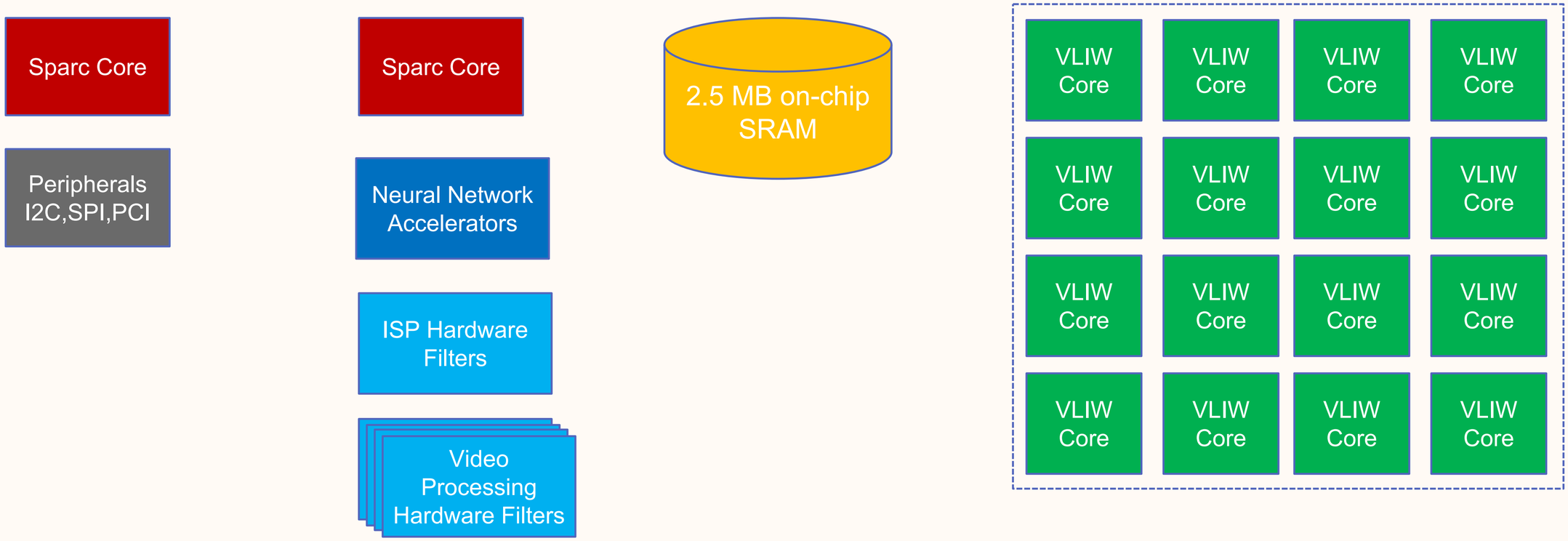
Huddly




5 people
Person
Person
Person
Person
Person
Bin
Content
Cup
Cup

Huddly

MyriadX

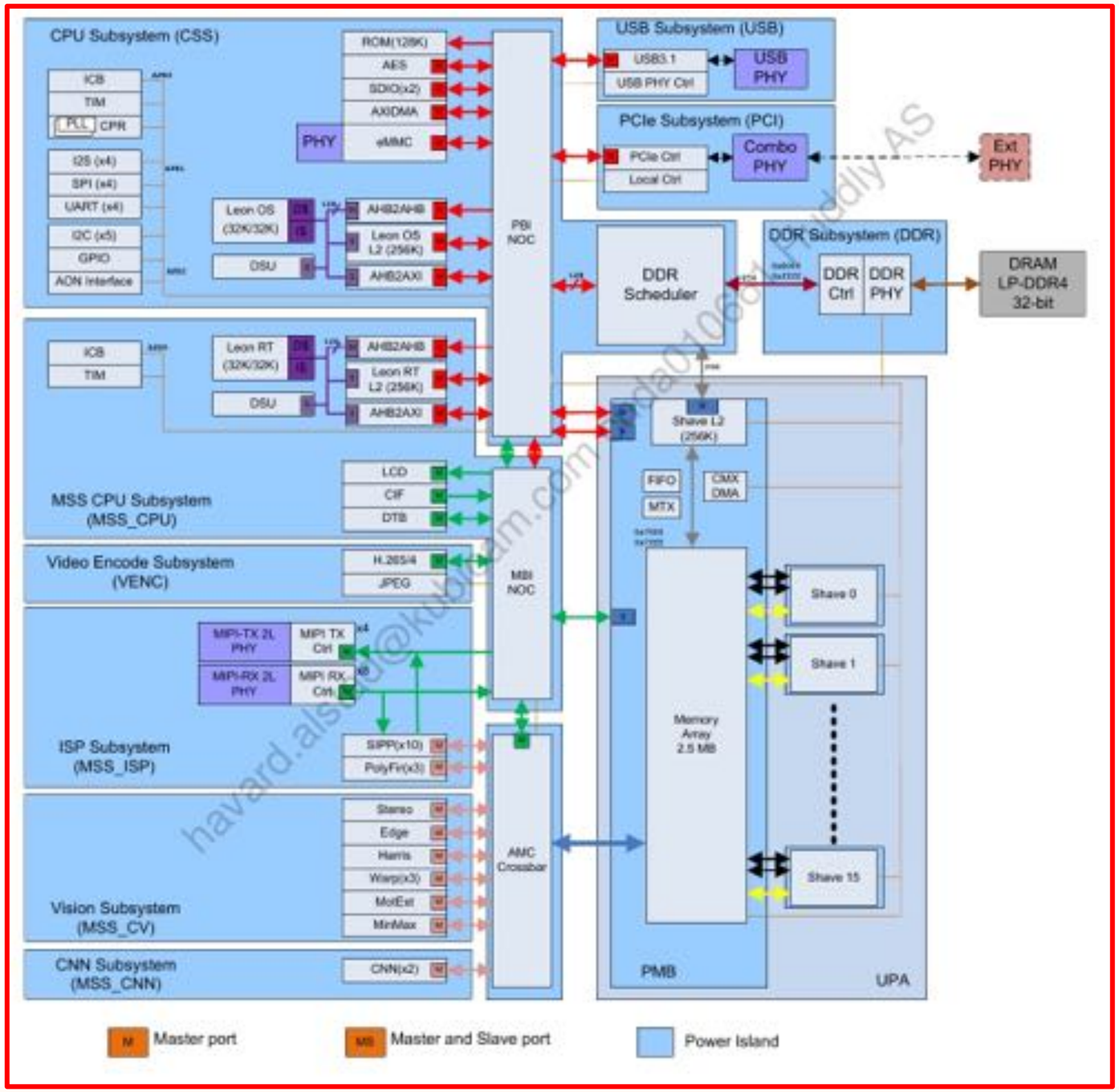


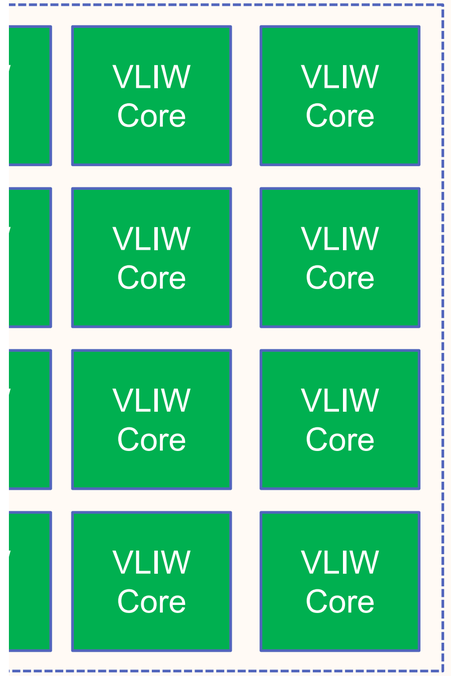
https://www.intel.com/content/www/us/en/products/docs/processors/movidius-vpu/myriad-x-product-brief.html

Myriad

Sparc Core

Peripherals
I2C,SPI,PCI





https://www.intel.com/content/www/us/en/products/docs/processors/movidius-vpu/myriad-x-product-brief.html

- **We have open positions for summer interns THIS year! Please apply before the 6th of March!**

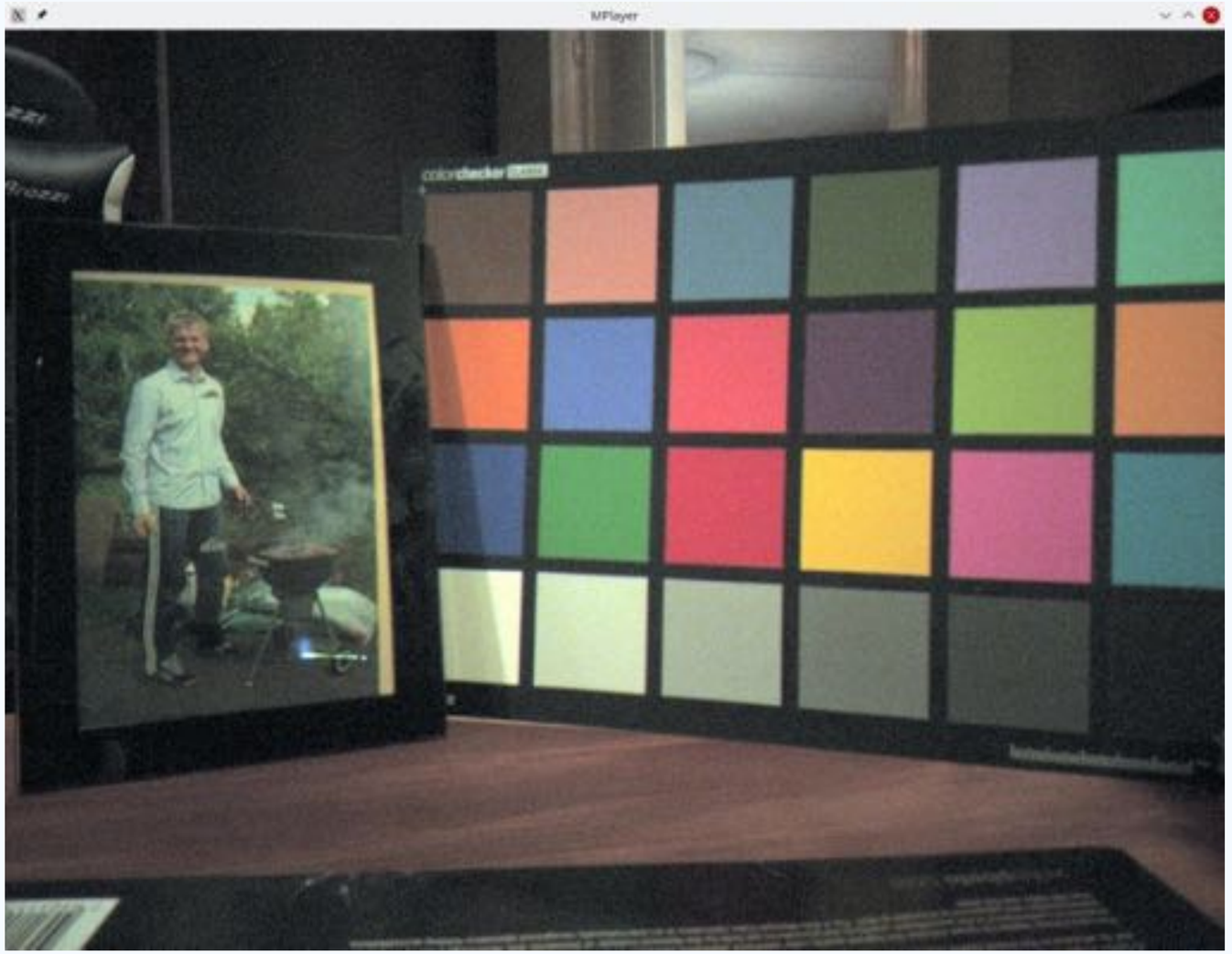
- **We are here if you want to do your master thesis with us!**

How do we get YUV from a camera?

Luma
Y

Chroma
U

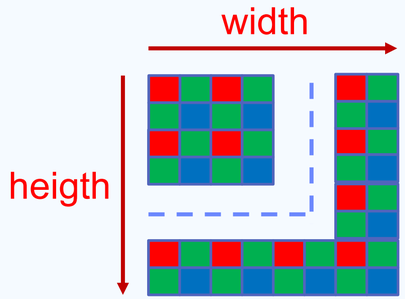
Chroma
V



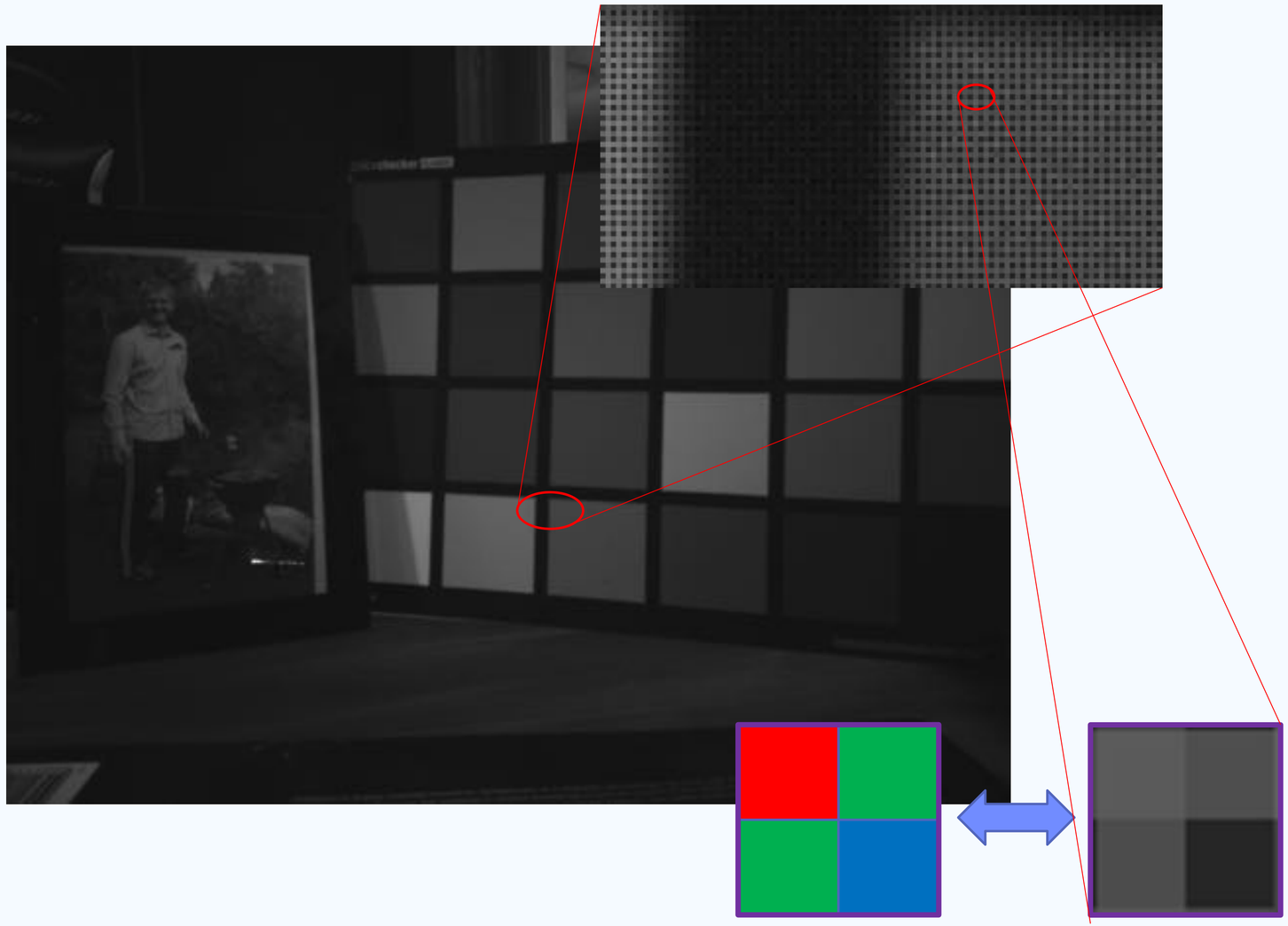
From Bayer to YUV



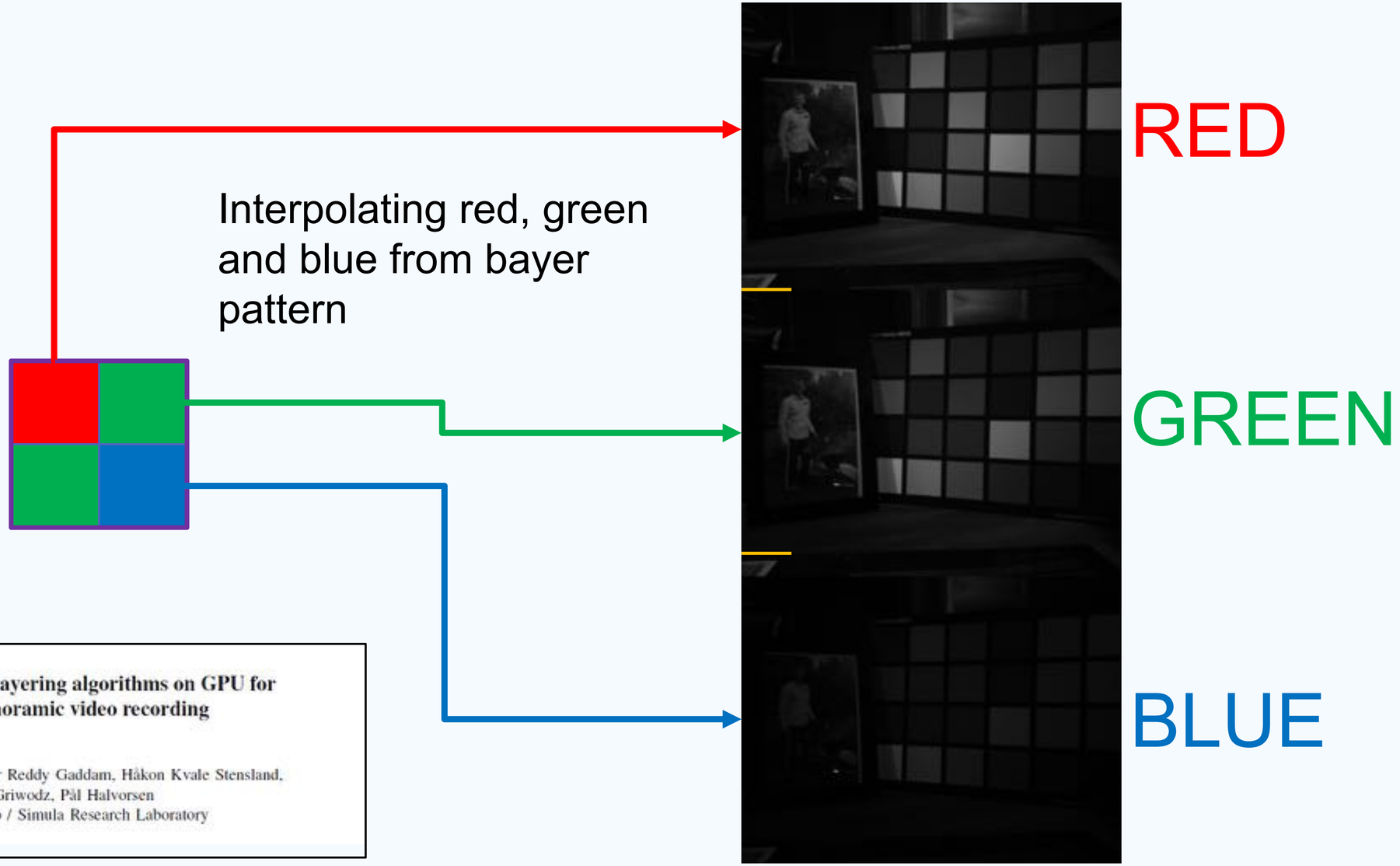
Raspberry Pi V2



Bayer mosaic pattern
(Color Filter Array)



From Bayer to YUV



An evaluation of debayering algorithms on GPU for real-time panoramic video recording

Ragnar Langseth, Vamsidhar Reddy Gaddam, Håkon Kvale Stensland,
Carsten Griwodz, Pål Halvorsen
University of Oslo / Simula Research Laboratory

Is this white…

..or this?

From Bayer to YUV



- **White balance such that R = G = B for white patches**

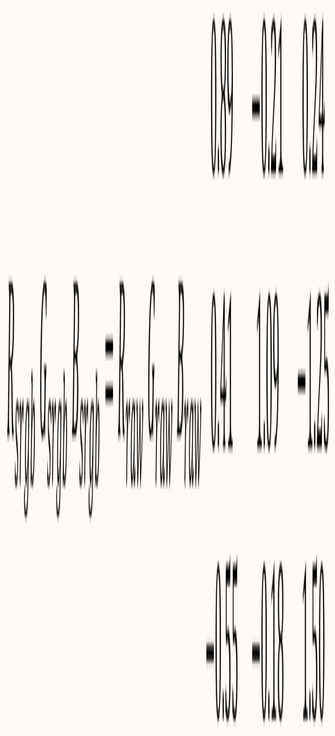
From Bayer to YUV



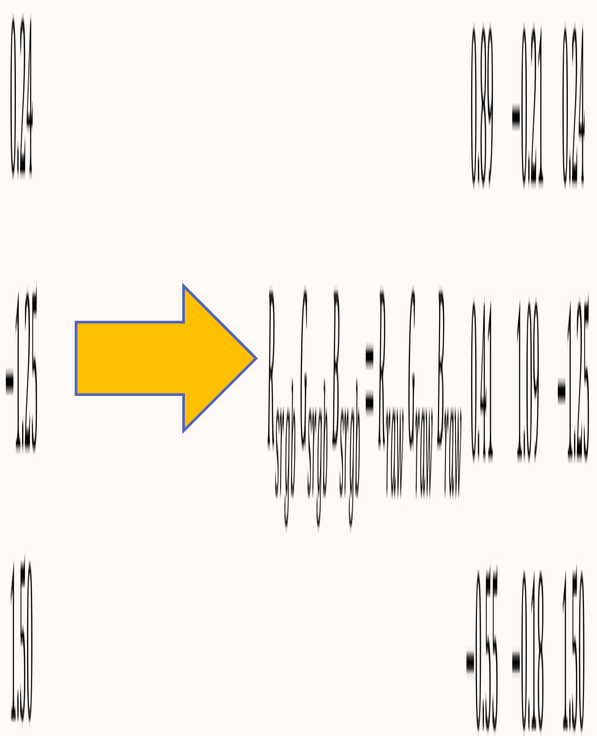
- **White balance such that R = G = B for white patches**

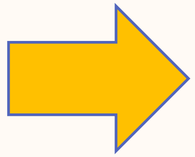
From Bayer to YUV

RAW

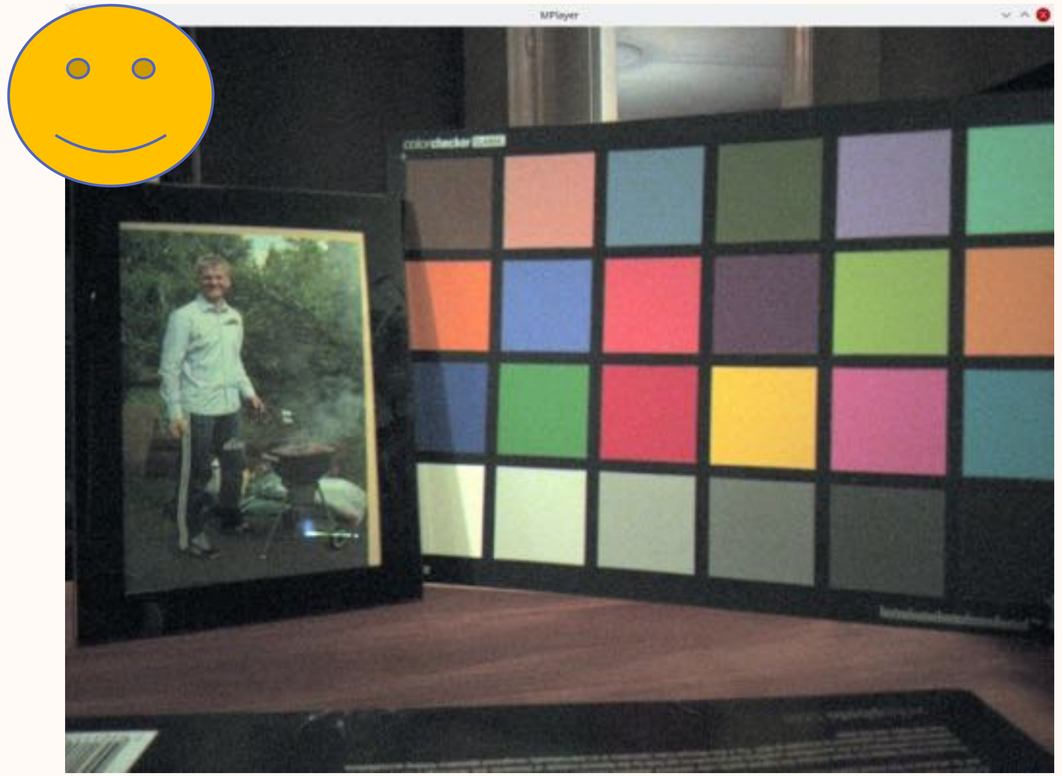


sRGB





YUV

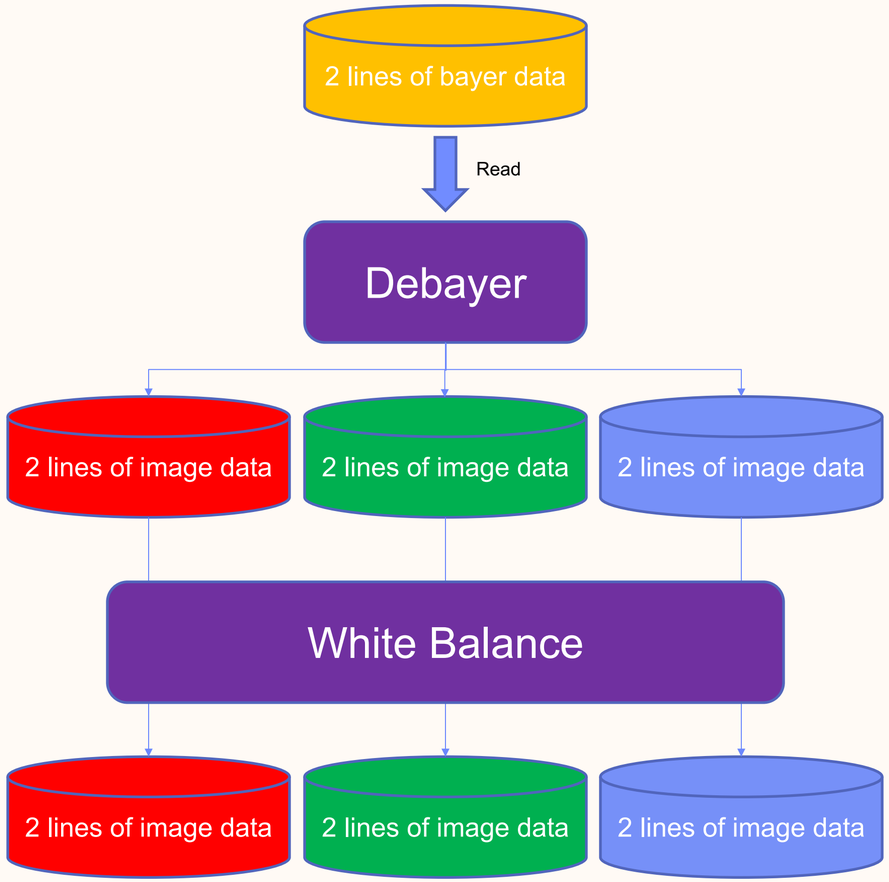


$$\begin{matrix} R_{srgb} & G_{srgb} & B_{srgb} \end{matrix} = \begin{matrix} R_{raw} & G_{raw} & B_{raw} \end{matrix} \begin{matrix} 0.89 & -0.21 & 0.24 \\ 0.41 & 1.09 & -1.25 \\ -0.55 & -0.18 & 1.50 \end{matrix}$$

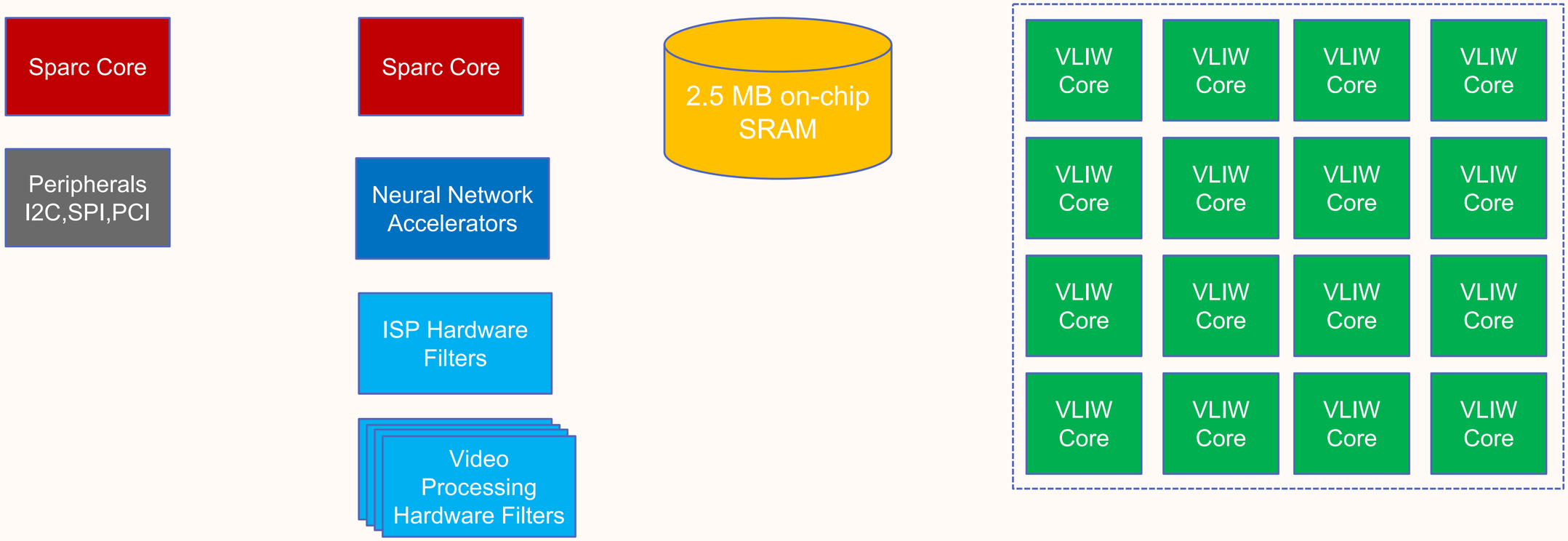
$$\begin{matrix} Y & U & V \end{matrix} = \begin{matrix} R_{srgb} & G_{srgb} & B_{srgb} \end{matrix} \begin{matrix} 0.29 & -0.14 & 0.61 \\ 0.58 & -0.28 & -0.51 \\ 0.11 & 0.43 & -0.1 \end{matrix}$$

Want to Study Raw Image Processing?

- **Pet project for Tegra Nano and Raspberry pi cam v2**
- **https://bitbucket.org/krisrst/minisp/**
- **Use ARM caches as SRAM buffers**
- **Possible to do studies on algorithms, near-ir light etc.**



MyriadX

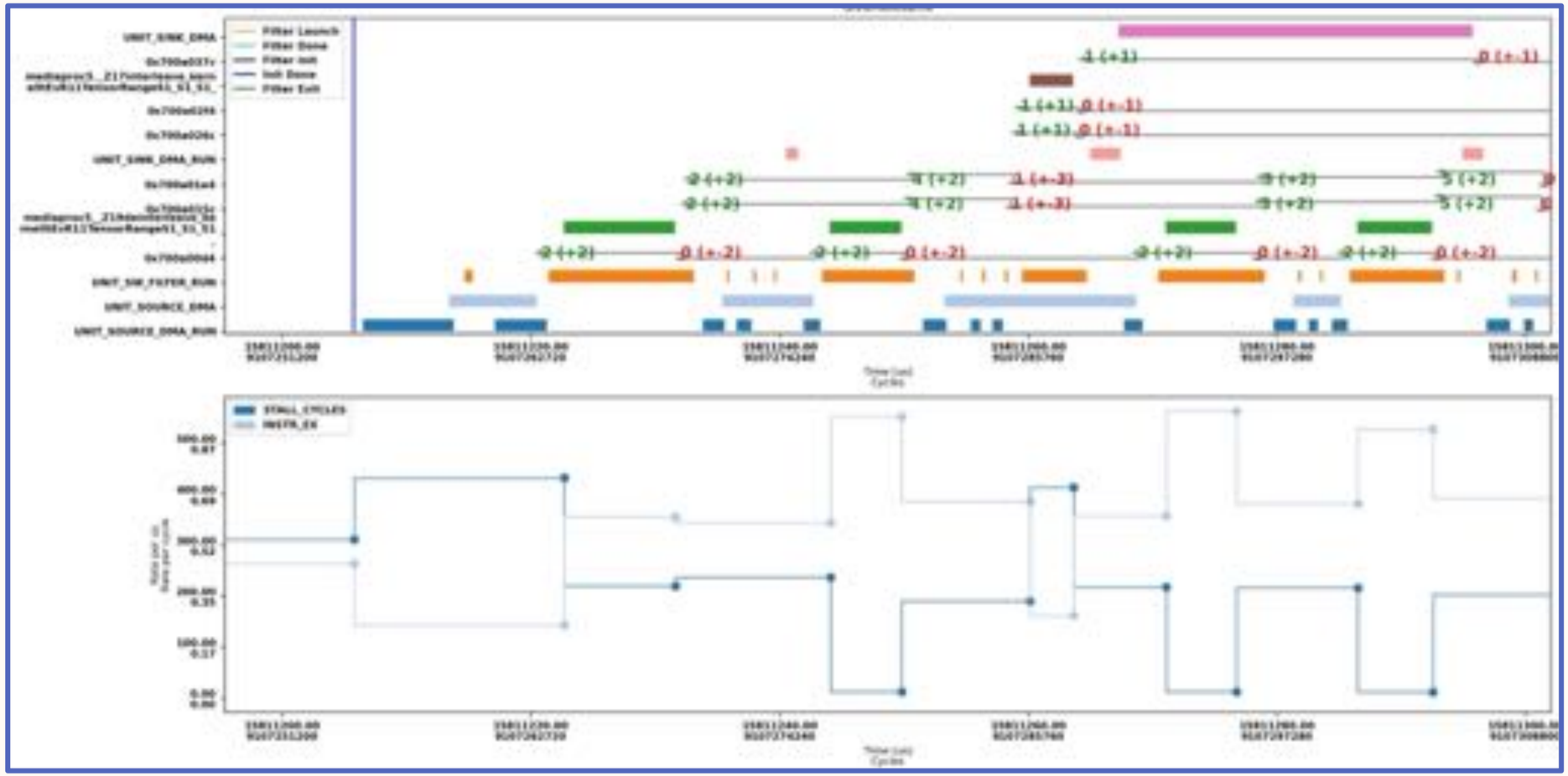


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Master Thesis at Huddly

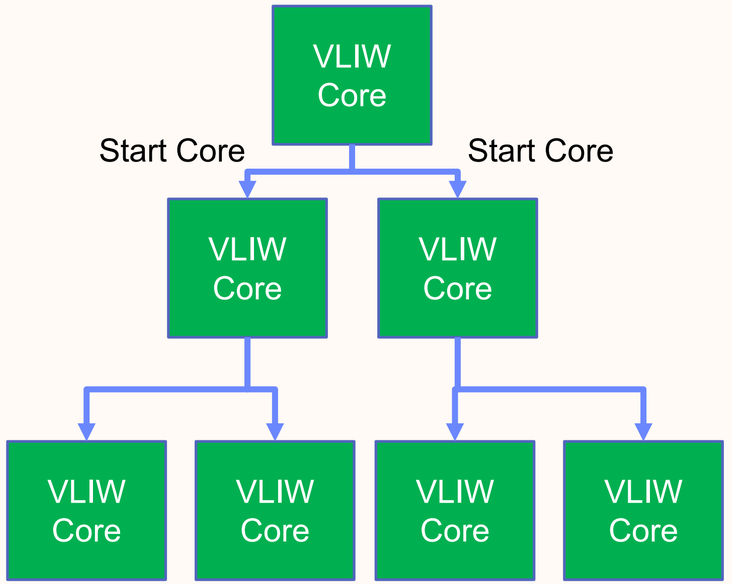
- **Understanding program flow of heterogeneous multicore architectures is very hard and challenging – and fun!**
- **Continue a profiling tool miniproject «myrprof»**
- **Abstract out an open source API maybe?**
- **Performance case study for an algorithm possible**

Profiling Tools - Example



Master Thesis at Huddly

- **We have 16 DSP cores**
- **Make a framework that can spawn other DSP cores from within a core (kind of like CUDA)**
- **Maybe we can use the C63 encoder as a case study?**



Master Thesis at Huddly

- **Can be anything really.**
- **We have ARM, x86, SPARC, VLIW, neural networks, FPGAs.. and more high-level coding departments.**
- **And a team of nice and motivated people ☺**
- **Got your own ideas, just curious, or want to learn more?**
- **Please visit us! There is no commitment.**

- **We have open positions for summer interns THIS year! Please apply before the 6th of March!**
- **We are here if you want to do your master thesis with us!**
- **Please contact us on email or phone**
- **robin.stokke@huddly.com**
  93 46 16 45