

# Crazy Machines, Crazy Developers

## Caphyon Lightning Talks

Victor Ciura | [@ciura\\_victor](#)

Principal Engineer, CAPHYON

January 2020



Let's do a live demo:

[quick-bench.com/cUo9JLcRLrQk36TRITRsH\\_h6Awg](https://quick-bench.com/cUo9JLcRLrQk36TRITRsH_h6Awg)

# Code Alignment

Code alignment matters a lot.

Know your machine:

- i-cache

Code alignment matters a lot.

Know your machine:

- i-cache
- MITE (Micro-instruction Translation Engine)

Code alignment matters a lot.

Know your machine:

- i-cache
- MITE (Micro-instruction Translation Engine)
- DSB (Decoded Stream Buffer)

Code alignment matters a lot.

Know your machine:

- i-cache
- MITE (Micro-instruction Translation Engine)
- DSB (Decoded Stream Buffer)
- LSD (Loop Stream Detector)

When doing micro-benchmarks, experiment with:

- `-mllvm-align-all-functions=5`
- `-mllvm-align-all-blocks=5`

# Instruction Layout

## Aligned Functions:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
a0	mov	mov	mov	mov	mov	mov	mov	vpcmp	vpcmp	vpcmp	vpcmp	nop	nop	nop	nop	nop
b0	vmov	vmov	vmov	vmov	vmov	vmov	vmov	vmov	vmov	vpsub	vpsub	vpsub	vpsub	vmov	vmov	vmov
c0	vmov	vmov	vmov	vmov	vmov	vmov	add	add	add	add	jne	jne	vzero	vzero	vzero	ret
d0																

## Aligned Blocks:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
a0	mov	mov	mov	mov	mov	mov	mov	vpcmp	vpcmp	vpcmp	vpcmp	nop	nop	nop	nop	nop
b0	nop	nop	nop	nop	nop	nop	nop	nop	nop	nop	nop	nop	nop	nop	nop	nop
c0	vmov	vmov	vmov	vmov	vmov	vmov	vmov	vmov	vmov	vpsub	vpsub	vpsub	vpsub	vmov	vmov	vmov
d0	vmov	vmov	vmov	vmov	vmov	vmov	add	add	add	add	jne	jne	nop	nop	nop	nop
e0	vzero	vzero	vzero	ret												
f0																

[https://easypref.net/blog/2018/01/18/Code\\_alignment\\_issues](https://easypref.net/blog/2018/01/18/Code_alignment_issues)



[easypref.net/blog/2018/01/18/Code\\_alignment\\_issues](https://easypref.net/blog/2018/01/18/Code_alignment_issues)

Denis Yaroshevskiy - Optimizing Generic Algorithms