CMC Microsystems: CAD, FAB, LAB
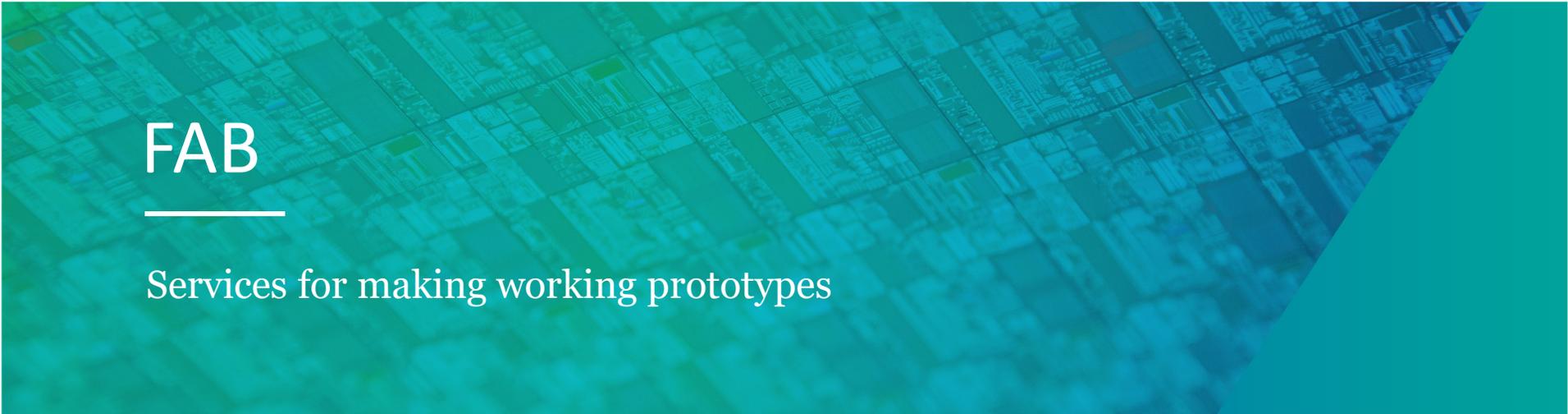
Workshop: Accelerating AI

OWAIN JONES, CRAIG JEFFREY

MARCH 6, 2020 | WORKSHOP: ACCELERATING AI

FAB

Services for making working prototypes

FAB delivers… MPW & custom fabrication

FAB

Services for making working prototypes

25 multi-project wafer services available through nine foundries worldwide, offering industrial-scale manufacturing

- Multi-project wafer services with affordable access to foundries worldwide
- Fabrication and travel assistance to prototype at a university-based lab
- Value-added packaging and assembly services
- In-house expertise for first-time-right prototypes

CMC.ca/FAB

40 university-based MNT fabrication labs across Canada helping researchers customize their designs
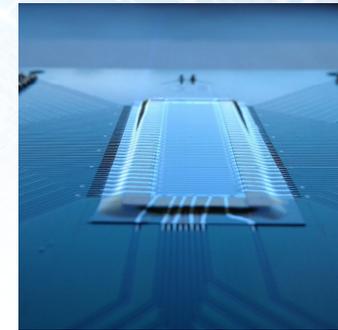
CMC

Industrial foundry runs
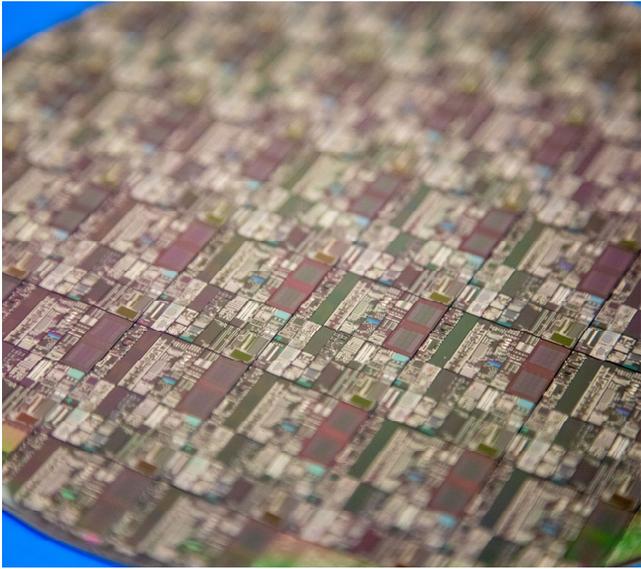
Custom Prototyping Network

MNT Portal

> More than 40 university-based micro-nanotechnology (MNT) labs across Canada.

> Capabilities include mask generation, etching, materials deposition, lithography, and characterization.

> Projects under NSERC Engage/ Alliance grants are eligible for an automatic award.

> www.cmc.ca/MNT-Portal

Academic researchers receive awards up to $3,500

More than 500 micro-nanotechnology prototypes have been enabled in university labs by financial assistance

LAB

Device validation to system demonstration

LAB delivers...

675
programmable
development systems

80
Pieces of test
equipment for rent

LAB

Device validation to system demonstration

- Access to platform-based microsystems design and prototyping environments
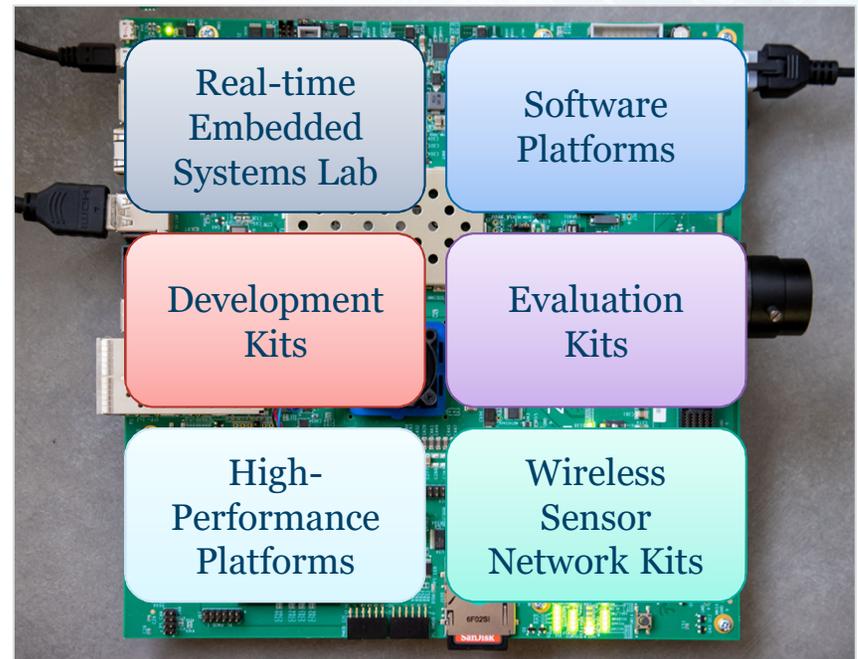- Access to test equipment on loan
- Access to contract engineering services

CMC.ca/LAB

CMC

Shorten the development cycle

Access platform-based microsystems design and prototyping environments

> Development Systems

> Equipment Rental program

> Services for emerging processes and products

> Contract R&D

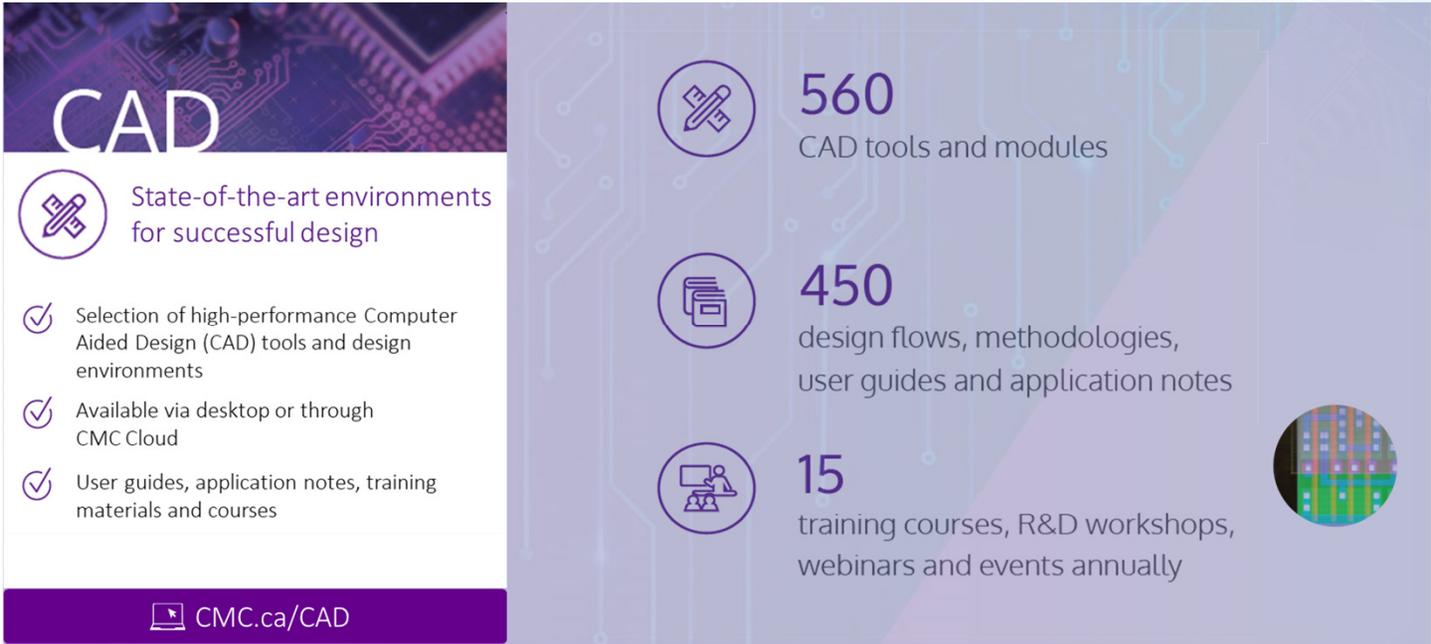And more: training, webinars, events, CMC engineer support

Real-time Embedded Systems Lab

Software Platforms

Development Kits

Evaluation Kits

High-Performance Platforms

Wireless Sensor Network Kits

CAD

State-of-the-art environments for successful design

CMC

CAD delivers…

CAD

State-of-the-art environments
for successful design

- ✓ Selection of high-performance Computer Aided Design (CAD) tools and design environments
- ✓ Available via desktop or through CMC Cloud
- ✓ User guides, application notes, training materials and courses

🖥 CMC.ca/CAD

560
CAD tools and modules

450
design flows, methodologies, user guides and application notes

15
training courses, R&D workshops, webinars and events annually

CMC

CAD - PDK, training, & support

Over 500 CAD tools and modules

Over 5000 individual users annually

alphacam

Altium

ANSYS

ARM

cadence

COMSOL

COVENTOR
A Lam Research Company

CROSLIGHT

DESIGN WORKSHOP TECHNOLOGIES

IAR SYSTEMS

intel FPGA

KEYSIGHT TECHNOLOGIES

LUCEDA PHOTONICS

lumerical

Mentor Graphics

NATIONAL INSTRUMENTS

Optiwave

Photon Design

softMEMS

DS SOLIDWORKS

SYNOPSYS

ThermoFisher SCIENTIFIC

XILINX

XperiDesk

Zemax

... AND MORE

CMC

CMC Cloud:
Design Environments

No local CAD server available?

> Complex design tools (e.g. Cadence, Mentor, Synopsys), scripts and licensing pre-configured and ready
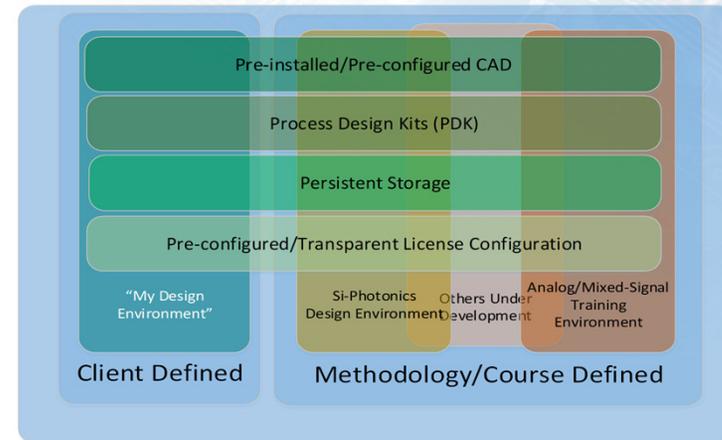
High quality server infrastructure

> Enterprise grade server infrastructure being used to run the tools in CMC Cloud

Time from concept to using tools

> After you discover you need to use a tool, with CMC Cloud you can be fully utilizing the tools within minutes

Immediate access to CMC supported design flows

> Design flows are developed and supported by CMC engineers

Pre-installed/Pre-configured CAD

Process Design Kits (PDK)

Persistent Storage

Pre-configured/Transparent License Configuration

"My Design Environment" | Si-Photonics Design Environment | Others Under Development | Analog/Mixed-Signal Training Environment

Client Defined | Methodology/Course Defined

CMC Cloud provides researchers with secure, high-performance, remotely accessible EDA resources for design of advanced microsystems and nanotechnologies.

CMC Cloud:
"mini" -HPC Cluster

Speed up your simulations

CMC engineers assist in utilizing the infrastructure as well as domain knowledge on utilizing HPC infrastructure

Documentation/reference designs available for ANSYS, COMSOL, Xilinx and more

Uniform array available in standard and large memory configurations

CAD Compute Cluster – 8 nodes

> Dual 16-core 2.1-.3.7 GHz CPU

> 4 nodes each with 384GB RAM

> 4 nodes each with 768GB RAM

> 300GB local storage

> 100Gb EDR node interconnect / 10GbE storage

CMC Cloud: FPGA/GPU Cluster

CPUs, GPUs and FPGAs in pre-validated cluster to scale heterogenous computing workloads

CMC engineers assist with access and application best practices

Hosted and managed by CMC as a cloud resource; accessible at your desktop

Reference designs using software stack for OpenCL + MPI heterogenous cluster computing

FPGA/GPU Cluster – 8 nodes

> Dual 12 core 2.2-to-3.0 GHz CPU
> 192 GB RAM
> 300 GB local storage
> 100 Gb EDR node interconnect
> 10 GbE storage network
> Xilinx Alveo U200 FPGA
> NVIDIA V100 GPU

CMC Cloud: Architecture

Seamless Transition Between Environments

> Design using our virtual infrastructure

> Decrease simulation times on our compute cluster

> Scale heterogeneous workloads on our FPGA/GPU accelerator cluster
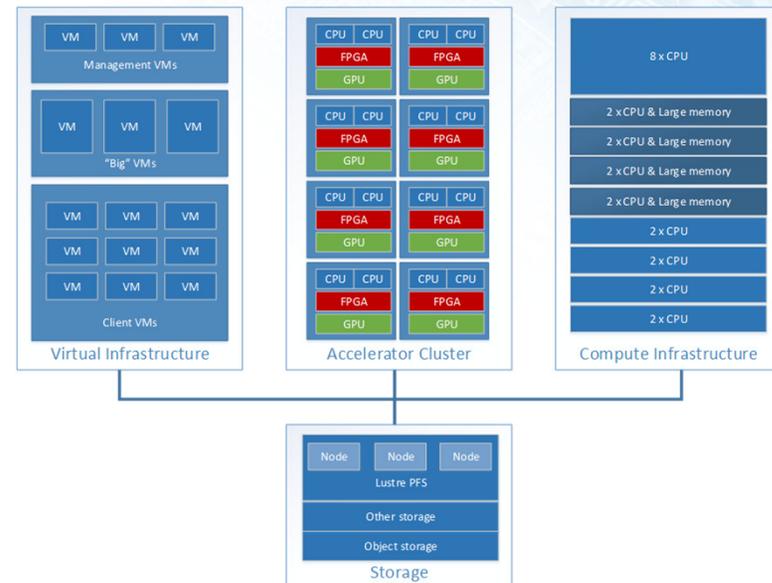
www.cmc.ca/CMCCloud

Research in the public cloud

CMC Microsystems offers members of the Cadence® University Software Program access to leading-edge technology through the Cadence Cloud Passport program

Cloud Passport:

> Cadence in public cloud

> Fully configured and installed:
> on-demand, continuous software updates, zero admin costs

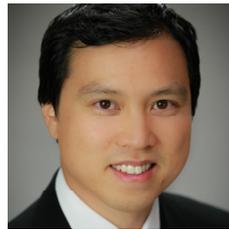> Access high-performance design lab anywhere

Related CMC Services:

> Training courses, webinars, and documentation

> PDKs from CMC suppliers

> CMC's fabrication services (DRC and MPW)

> Cadence license management

Key contacts...

Dan Deptuck
Staff Scientist Optoelectronics Engineering

Andrew Fung
Client Technology Advisor

Craig Jeffrey
IT Enterprise Architect

Owain Jones
Manager, CAD Services

Hugh Pollitt-Smith
Senior Engineer Systems Design

Gayathri Singh
Senior Engineer, Manager FAB Services

CMC

Thank you!

Owain Jones, M.Eng., P.Eng.

Manager, CAD Business Unit

Direct: (613).530.4784

Mobile: (613).484.6177

cad@cmc.ca | owain.jones@cmc.ca

www.CMC.ca