



# WHAT'S IN YOUR CUDA TOOLBOX? CUDA PROFILING, OPTIMIZATION, AND DEBUGGING TOOLS

CONNECT WITH THE EXPERTS

# DEVTOOLS EXPERTS

## Breakout room assignments



**Daniel Horowitz** – Director of Engineering - Platforms

Breakout room: Nsight Systems



**Magnus Strengert** – Engineering Manager – Compute Profiling

Breakout room: Nsight Compute



**Steve Ulrich** – Engineering Manager – Compute Debuggers

Breakout room: Debuggers & IDE integrations

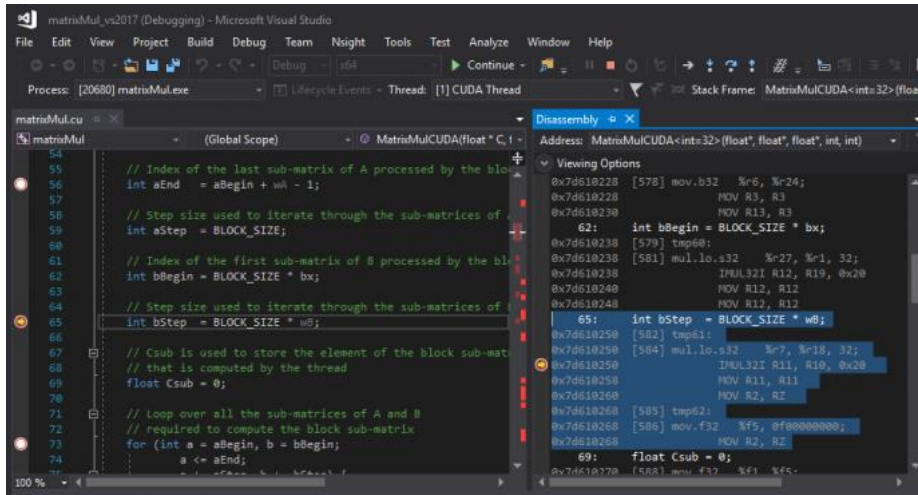


**Aurelien Chartier** – Senior Software Engineer – Memory Checkers

Breakout room: Compute Sanitizer

# DEVELOPER TOOLS

**Debuggers:** cuda-gdb, Nsight Visual Studio Edition  
Nsight Visual Studio Code Edition



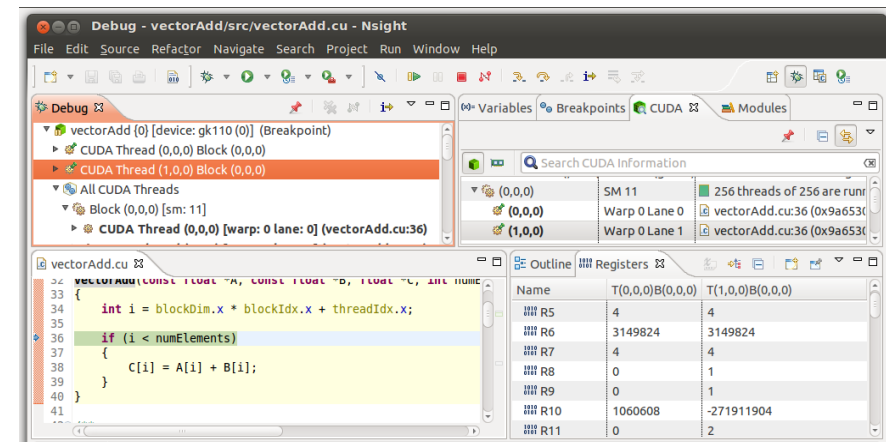
**Profilers:** Nsight Systems, Nsight Compute, CUPTI, NVIDIA Tools eXtension (NVTX)



**Correctness Checker:** Compute Sanitizer

```
$ compute-sanitizer --leak-check full memcheck_demo
===== COMPUTE-SANITIZER
Mallocing memory
Running unaligned_kernel
Ran unaligned_kernel: no error
Sync: no error
Running out_of_bounds_kernel
Ran out_of_bounds_kernel: no error
Sync: no error
===== Invalid __global__ write of size 4 bytes
===== at 0x60 in memcheck_demo.cu:6:unaligned_kernel(void)
===== by thread (0,0,0) in block (0,0,0)
===== Address 0x400100001 is misaligned
```

**IDE integrations:** Nsight Eclipse Edition  
Nsight Visual Studio Edition  
Nsight Visual Studio Code Edition



# DEVELOPER TOOLS ACROSS GTC

- Sessions
  - [S41493](#) - What, Where, and Why? Use CUDA Developer Tools to Detect, Locate, and Explain Bugs and Bottlenecks
  - [S41447](#) - Orin Developer Tools: The Next Frontier
  - [S41723](#) - How to Understand and Optimize Shared Memory Accesses using Nsight Compute
  - [S41500](#) - Optimizing Communication with Nsight Systems Network Profiling
  - [S41518](#) - Killing Cloud Monsters Has Never Been Smoother
  - [S41859](#) - GPU Performance Analysis and Improvements utilizing the NVIDIA Nsight Perf SDK
  - Full list of [Top Session for Developer Tools](#)
- Labs
  - [DLIT2169](#) - Optimizing CUDA Machine Learning Codes with Nsight Profiling Tools
  - [DLIT2207](#) - Debugging and Analyzing Correctness of CUDA Applications
  - [DLIT2319](#) - Developer Tools Fundamentals for Ray Tracing using NVIDIA Nsight Graphics and NVIDIA Nsight Systems
- Connect With Experts
  - [CWE41541](#) - What's in your CUDA toolbox: CUDA Profiling, Optimization, and Debugging Tools
  - [CWE41887](#) - Connect with the Experts: Getting Started with Ray Tracing and NVIDIA's Ray Tracing Developer Tools
- Developer Tools are free and packaged in the latest version of the CUDA Toolkit
  - <https://developer.nvidia.com/cuda-downloads>
- Support is available via:
  - <https://forums.developer.nvidia.com/c/development-tools/>
- More information at:
  - <https://developer.nvidia.com/tools-overview>