



Position Statement: Benjamin M. Brosgol

Developing the FACE Technical Standard has presented non-trivial challenges that, over the past ten years, have largely been met. But now that the standard is mature and is attracting increasing interest from the defense community and its suppliers, a number of new challenges have arisen. Some can perhaps best be met by the Business WG -- for example, simplifying the certification procedures without weakening the requirements, and introducing the concept of tool qualification so that component developers can automate some of the processes required for conformance. Other challenges apply to the Technical WG. More specifically, since this WG comprises ten subcommittees, the risk of "silozation" needs to be mitigated, and the evolution of the FACE Technical Standard needs to be managed carefully so that it can respond to new developments in avionics technology in a controlled but timely fashion. Perhaps most importantly, and an initiative that spans both the Business and Technical WGs, it's critical to provide a training program that accurately presents the FACE technical approach and makes it easier for potential adopters to come up to speed with the FACE technology.

If elected as Vice-Chair of the TWG, I will work to help meet these challenges. My experience in other standardization efforts (under ISO for Ada and under the Java Community Process for the Real-Time Specification for Java) has given me a useful perspective on distinguishing what is possible in theory from what is realistic in practice, and in achieving consensus in the presence of difficult tradeoffs.

#### Bio Sketch

Dr. Benjamin Brosgol is a member of AdaCore's senior technical staff. He has been involved with programming language design and implementation throughout his career, concentrating on languages and software engineering technologies for high-assurance systems. Dr. Brosgol was a member of the design team for Ada 95, and he also served in the Expert Group for the Real-Time Specification for Java (Java Specification Request JSR-001). He is an active member of the Operating Systems Subcommittee of the FACE Consortium's Technical Working Group, where he has been a major contributor to the specification of the IDL-to-Ada mapping and the definition of Ada 2012 Capability Sets, and he has written articles and delivered talks on FACE related technologies at several FACE Technical Interchange Meetings. Dr. Brosgol has presented papers and tutorials on high-assurance software topics at numerous

conferences and workshops including ESC (Embedded Systems Conference), ICSE (IEEE/ACM International Conference on Software Engineering), IEEE Security Development (SecDev), STC (Software Technology Conference), and conferences run by the ACM Special Interest Group on Ada (SIGAda) and Ada-Europe. Dr. Brosgol holds a BA in Mathematics (with honors) from Amherst College, and MS and PhD degrees in Applied Mathematics from Harvard University.

FACE related articles authored or co-authored by Dr. Brosgol:

- \* "Towards Safety and Security in FACE™ Components: High Assurance with Portability"; B. Brosgol, D. Smith; Military Embedded Systems, March 2018
- \* "Ada Language Run-Times and the FACE™ Technical Standard: Achieving Application Portability and Reliability"; B. Brosgol, P. Rogers, D. Smith; Army FACE™ Technical Interchange Meeting, Huntsville AL; Sept. 2018
- \* "Portable, Reliable and Efficient Concurrency: Ravenscar Ada Tasking and the FACE™ Safety Profiles"; B. Brosgol, P. Rogers, D. Smith; Military Embedded Systems, November-December 2018
- \* "Verifying High-Assurance FACE Components with Ada and SPARK: Combining Formal Methods and Testing"; B. Brosgol; Air Force Technical Interchange Meeting, Dayton OH; Sept. 2019.
- \* "DO-178C Meets the FACE Technical Standard: High Assurance and Reusability for Airborne Software"; B. Brosgol; Military Embedded Systems, March 2020