Research, Evaluation, and Development of Communication and Collaboration Tools for Global Automotive Engineering

Relevance to the Automotive Industry:	Working in distributed teams, especially but not only globally allocated ones, creates a need for efficient communication and collaboration tools generated for the resulting specific work environments. The research, evaluation and development of these tools are important to the automotive industry to save effort, time, and money, and lead to an improved time-to-market time, improved products, and to reduced costs in global projects. Two examples of currently globally active companies are the GM cooperation who shares design projects among its locations in Germany (Opel), China (Daewoo) and the USA (GM) and the Ford Motor company, who collaborates intensely with its suppliers.	
Research Location:	TUD *Datenverarbeitung in der Konstruktion (DiK)*	VT *Global Collaborative Engineering Design (GCED)*
Homepage (Engl.):	http://www.dik.maschinenbau.tu-darmstadt.de/en	http://www.me.vt.edu/MENewSite/Faculty/Bohn/bohn.php
Faculty Mentor:	Prof. Dr.-Ing. Reiner Anderl	Prof. Jan Helge Bøhn, Ph.D.
Faculty Mentor Email:	anderl@dik.tu-darmstadt.de	bohn@vt.edu
Graduate Mentor:	Dipl.-Ing. Diana Völz	Dipl.-Ing. Susanna Schmidt
Graduate Mentor Email:	voelz@dik.tu-darmstadt.de	srsch@vt.edu

Project Description:
 	
Jun 9 - Aug 1, 2008;
 	
(8 weeks, 40h/week)
	The research groups *Datenverarbeitung in der Konstruktion* at TUD and *Global Collaborative Engineering Design* at VT are jointly investigating communication and collaboration tools for globally distributed engineering teams in the automotive industry. For this project, one NSF REU student will be assigned to each research location. These two students will participate in the effort of researching, evaluating, and developing communication and collaboration tools, such as Skype, Gizmo, Google's products, NetMeeting, Adobe Connect, Microsoft Office Groove, Arel, Elluminate, and Teamcenter Community, and their potential integration.
	    The students will start with a two-week intense reading and experimental phase to become familiar with the systems, programming languages, and the current state of the research. Following this introductory phase, the students will systematically compare the systems on a scale that will be developed as part of the project. Criteria of interest include, but are not limited to: audio quality; computer security; user friendliness; automated data synchronization for collaboration environments; exchange and use of 3D CAD models; simultaneous editing of files; and software stability. After the completion of the research and evaluation phases, the students will propose and start the developing, at least in part, the ideal communication and collaboration system for globally distributed engineering teams.
	    The students are expected to work together transatlantic on this joint project, and to interact and communicate intensely with each other on a daily basis using these same communication and collaboration technologies in addition to high-end video conferencing, instant messaging, VOIP, emails, desktop sharing, and product lifecycle systems. The project management plan, manuals, literature, notes, and research findings are just a few examples of data that should be shared among the participating students and advisors.	

Necessary Skills/ Knowledge:	• Microsoft Windows (operating system)	
Desirable Skills/ Knowledge:	• Unix (operating system) • Any programming language and experience	
Additional Online Resource:	http://www.global-engineering-excellence.org/en/global_engineering_study/ http://www.globalhub.org/	

NSF REU Students must have completed at least two semesters of engineering studies prior to the proposed summer research, and they must have at least one semester remaining before they can earn their BS in Engineering.