Challenges in Software Engineering:
Developing Software in New and Complex Domains
(Symposium Session)

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Computer systems and software has become a basic tool in nearly every field and industry imaginable, including not only traditional business domains but also emerging complex fields and projects within natural and social science, art, and the humanities. Where computer systems go, so does the software engineer. It is thus very likely that the software engineer will have to create a solution in a field that he or she has little to no understanding about, possibly using tools developed for this field that they are not familiar with. For example, the presenters have been involved in projects with optical recording, molecular biology data and pattern matching, development of surveys for psychologists and the storage and modeling of astronomical data.

The purpose of this interactive discussion is to pool and share our collective knowledge to enable us to succeed and teach others how to succeed in this situation. Discussion topics and issues will include:

- Where to start?
- How can you prepare for this situation?
- What techniques does the field of software engineering provide for these endeavors?
- What resources do software engineers have in this situation?
- How can software engineers develop a common language with the domain experts to encourage accurate communication?
- How do we work with legacy algorithms, paradigms and code, potentially written by domain experts that may not have been trained in current software development techniques?
- How can we learn about these new domains quickly?
- How can you test when you don't know the answer?
- How can you optimize a solution you don't understand?
- How can you lead a team in this situation?
- How can we teach others to succeed in this situation?