THE TRADEOFFS OF SOCIETAL COMPUTING

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MOTIVATION

- Increasing specialization of Computer Science research into subareas and sub-subareas
- "**Jack of all trades, master of none**"?
- We are experts in our specialized subareas and relatively unaware of the other areas

MOTIVATION

- Advanced research and progress in one area may have a negative effect on some other research area
- Such tradeoffs exist is many different areas and a broadening of research scope is necessary to effectively address them
- We need a more **holistic view** of research

SOCIETAL COMPUTING

- New research area for Computer Scientists concerned with the impact of **computational tradeoffs** on **societal issues**

- Privacy, Climate Change, Sustainability and Green Computing, Cultural Differences, Ethics, ...

PRIVACY VS. GREEN COMPUTING

- Privacy is becoming an increasingly important concern
- State-of-the-art techniques to preserve/analyze a software system's privacy properties - **great** as far as **privacy** is concerned
- These might require substantial computational resources - **bad idea** as far as **Green Computing** is concerned
- How do we **balance** privacy with green computing?

GREEN COMPUTING VS. GREEN COMPUTING

- Interesting (and recursive) tradeoff of Green Computing with itself

- We may need to spend a lot of computational resources to (research and) develop greener software systems

- In the worst case, the amount of resources spent on this may far outweigh the energy benefits of replacing the less-green systems - "**penny wise, pound foolish**"

- How do we analyze this before expending these resources?

HOW CAN WE CONTRIBUTE?

- Common theme - **finding the right balance** between the different areas of Societal Computing
- Develop metrics to compare impact on diverse subareas
- Spend **more human time** than computer time?
- More multi- and inter-disciplinary research

HOW CAN WE CONTRIBUTE?

- The **software engineering/programming languages** community has a **special** role to play

- Design patterns, architectural metaphors, better tools, APIs, smarter compilers, better testing techniques, new programming languages to deal with these concerns

- **Help other communities** make an easier decision when it comes to tradeoffs

- Address how to implement these balanced systems

enable (vt) **:** *to make possible, practical, or easy*

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