# NSF/SRC Design Automation Forum Increased Diversity

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Design Technology

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# Increased Diversity in Design

**Chip Creation**

| Architecture Specification |
|---|

| **Auto-Assembly & Compilation** |
|---|
| Hardware | Software | Memory |
| Package | Verification | Resiliency |

| Module Characterization |
|---|

**Module Creation**

| Modeling | Analysis | Verification | Compiler | Compiler | Compiler | Optimizer | Optimizer |
|---|---|---|---|---|---|---|---|

| Component Characterization |
|---|

**Component Creation**

| Digital | Analog | RF | Photonics | MicroMechanical | BioElectrical | MicroFluidic | Nanotubes |
|---|---|---|---|---|---|---|---|

**Common Parameters for Diverse Technologies**

Function
Timing
Power
Interference
Area/Volume
Yield
Reliability
Verification
Self-Test
Variability

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# Increased Diversity Challenges

- Modeling of New Technologies
  - Definition of parameters specific to a new technology
  - Model physical interactions among diverse technologies
  - Abstraction of key parameters to Chip/System Design

- Component Characterization
  - Identify common parameters required to integrate new technologies into the module design process
  - Characterize components to all required parameters
  - Modify design process to handle new parameters

- Design of Diverse Technologies
  - Design & verify technologies described differential equations

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