Safe, concurrent programming languages
to reliably exploit multicore architectures
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Automatic Code Transformations
NSF – Symbolic Commutativity Analysis

Reliability of binary executables
ONR – Temporal Analysis

Verification of Advanced Languages
Collaboration with Japanese Univs.

Advanced Type Systems

\[
\Phi = (\lambda x \in \Sigma^* . x = a, \lambda x \in \Sigma^{\omega} . \bot) \\
\begin{align*}
\Gamma &\vdash \text{ev}[a] : (\{x \mid x = 0\} \& \Phi) \\
\Gamma &\vdash v_1 : (\tau : (\tau' \& \Phi) \& \Phi_{\text{fail}}) \\
\Gamma &\vdash v_2 : (\tau \& \Phi_{\text{fail}}) \\
\Gamma &\vdash v_1 \cdot v_2 : [v_2/x](\tau' \& \Phi)
\end{align*}
\]