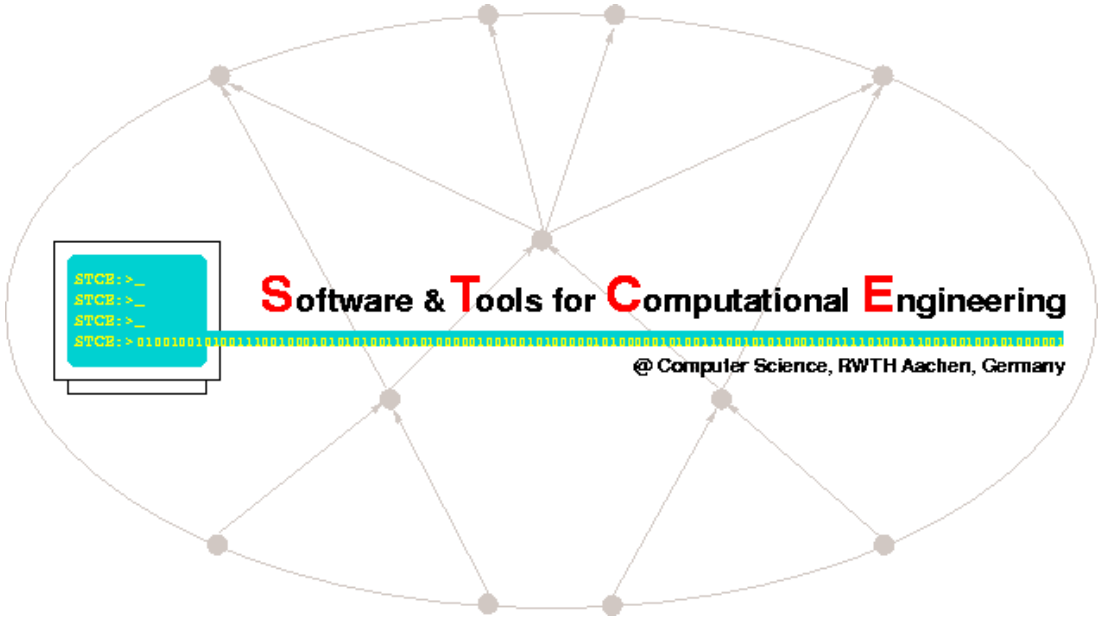



# Adjoint Compiler Technology

Ebadollah Varnik and Uwe Naumann
RWTH Aachen University, Germany

# Introduction – Adjoint Code

We consider vector function $F : \boldsymbol{R}^n \rightarrow \boldsymbol{R}^m$, with

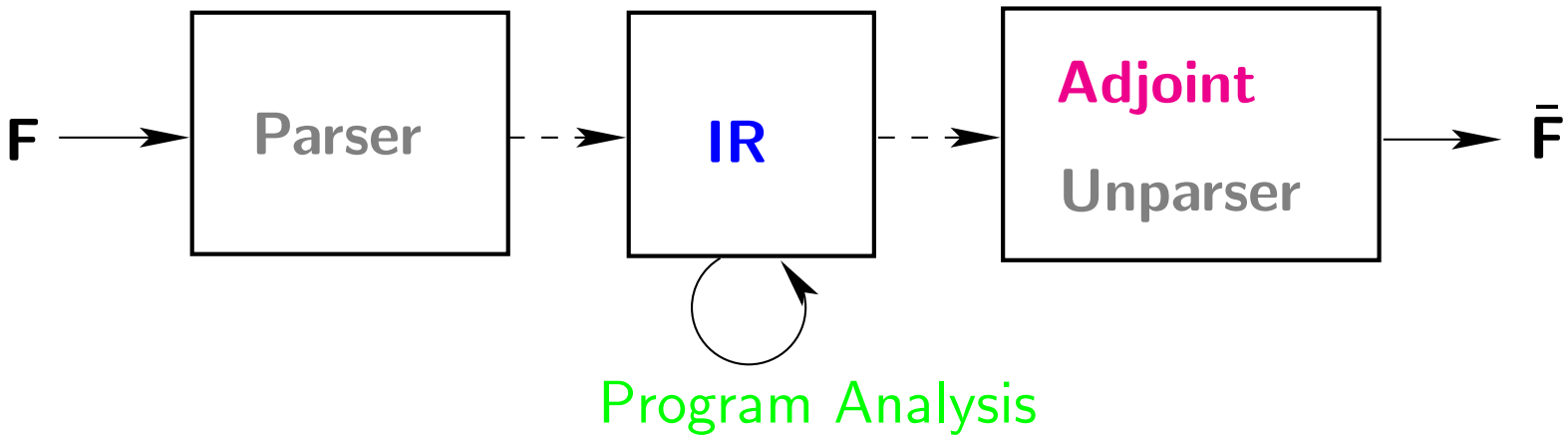
$$F(\mathbf{x}) = \mathbf{y} \quad .$$

The adjoint code of $F$ computes

$$\bar{\mathbf{x}} = F'(\mathbf{x})^T \cdot \bar{\mathbf{y}} \quad .$$

- Complexity $O(m)$
- **Data Flow Reversal**

# Adjoints by Source Transformation




Adjoint Projects

- **ACTS** in collaboration with Argonne, MIT and Rice (**OpenAD**, platform for source transformation)
- **CompAD** in collaboration with, Hertfordshire (**F95 Compiler**)