

CO3 (Ver. 2.7)

a **C**onverter for proving **C**onfluence of **C**onditional TRSs

Naoki Nishida Misaki Kojima
Nagoya University, Japan

Overview

CO3 proves confluence of 3-DCTRSs or infeasibility of conditions by using

- very simple termination/confluence criteria for TRSs
- the improved sequential **unraveling** $\mathcal{U}_{conf}$ [Gmeiner et al, 13],
- **narrowing trees** [Nishida & Maeda, 18]

Infeasibility and Confluence Criterion

- Condition c is infeasible w.r.t. DCTRS $\mathcal{R}$ if $\mathcal{U}_{conf}(\mathcal{R})$ is right-linear and a **narrowing tree for c** defines $\emptyset$ [Maeda et al, 19]
- Syntactically deterministic 3-CTRSs $\mathcal{R}$ is confluent if either
 - ▶ $\mathcal{R}$ is weakly left-linear and $\mathcal{U}_{conf}(\mathcal{R})$ is confluent [Gmeiner et al, 13]
or
 - ▶ $\mathcal{U}_{conf}(\mathcal{R})$ is terminating and right-linear
and $\forall \langle s, t \rangle \Leftarrow c \in CP(\mathcal{R}), (c = \epsilon \wedge s = t) \vee$ “ c is infeasible” [Maeda et al, 19]
- Implemented a very light LPO and RPO for termination
- Joined CTRS, INF, and **TRS** of CoCo 2026

[Ver. 2.7]