

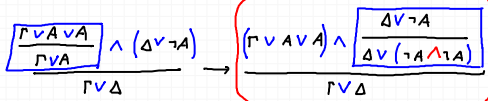
DEEP INFERENCE
FREE COMPOSITION OF PROOFS → LOCALITY

PROBLEM WITH THE SEQUENT CALCULUS



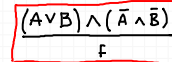
TWO DISTINCT COMPRESSION/COMPOSITION MECHANISMS ARE CONFLATED

NATURAL SOLUTION



CUT INDEPENDENT FROM CONTRACTION

LOCALITY OF CUT

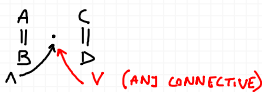


ONE BIG CUT
↓
MANY SMALL

(A ∨ B) ∧ C
A ∨ (B ∧ C)
SWITCH

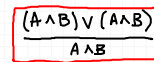
¬A = DE MORGAN DUAL OF A
ALL MODULE COMM. AND ASS.

FREE COMPOSITION



THIS PROOF BECOMES VALID

LOCALITY OF (CO)CONTRACTION

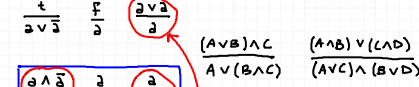


ONE BIG CONTR.
↓
MANY SMALL

(A ∧ B) ∨ (C ∧ D)
(A ∧ B) ∨ (C ∧ D)
MEDIAL

NEXT: HOW TO RECOVER AND GENERALISE GENTZEN METHODS — SPLITTING (+ DECOMPOSITION)

CLASS. PROP. LOGIC



ADMISSIBLE COMPRESSION MECHANISMS ARE SEPARATE

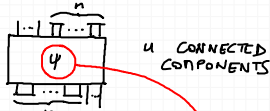
SHARING (DAGNESS)

OPEN PROBLEMS AT THE END OF TUTORIAL

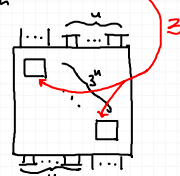
DEEP INFERENCE
LOCALITY → TOPOLOGY CONTROLS NORMALISATION

STREAMLINING IN PROPOSITIONAL CLASSICAL LOGIC

1. TAKE A DERIVATION φ :



2. PICK THE NORMALISER FOR u:



3. PLUG φ INTO THE HOLES. VOILA!

EVEN BETTER: CUT ELIMINATION TRIVIAALLY CONFLUENT

- NEXT, THE EXPERIMENT METHOD

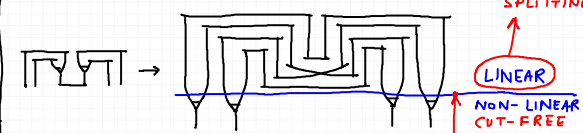
GENERAL CUT ELIMINATION (STREAMLINING)



CURRENT RESEARCH: 1. MAKE DECOMPOSITION 'UNIVERSAL' 2. MAKE SPLITTING LOGIC INDEPENDENT → SUBATOMIC LOGIC

→ UNDERSTANDING CUT ELIMINATION

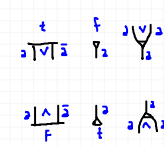
DECOMPOSITION: PUSH (CO) CONTRACTIONS (SUBATOMIC) SPLITTING



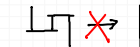
NON-LINEAR CUT-FREE

HERBRAND FORMULA

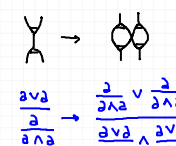
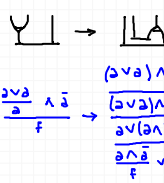
ATOMIC FLOWS



CUT ELIMINATION = ~~X~~
NO SANKING:



SOUND TRANSFORMATIONS



CONTRACTION VS. CUT: DOES NOT AFFECT COMPLEXITY

CONTRACTION VS COCONTRACTION: DOES AFFECT COMPLEXITY

THE TWO MECHANISMS ARE INDEPENDENT