



Russian Association of TRIZ

The International Public University of TRIZ



Formula Of The Concepts Definition

and Its Application to Basic
Concepts of Contemporary TRIZ

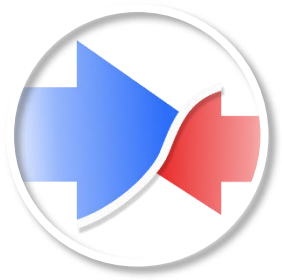
Especially for:

TFC 2018

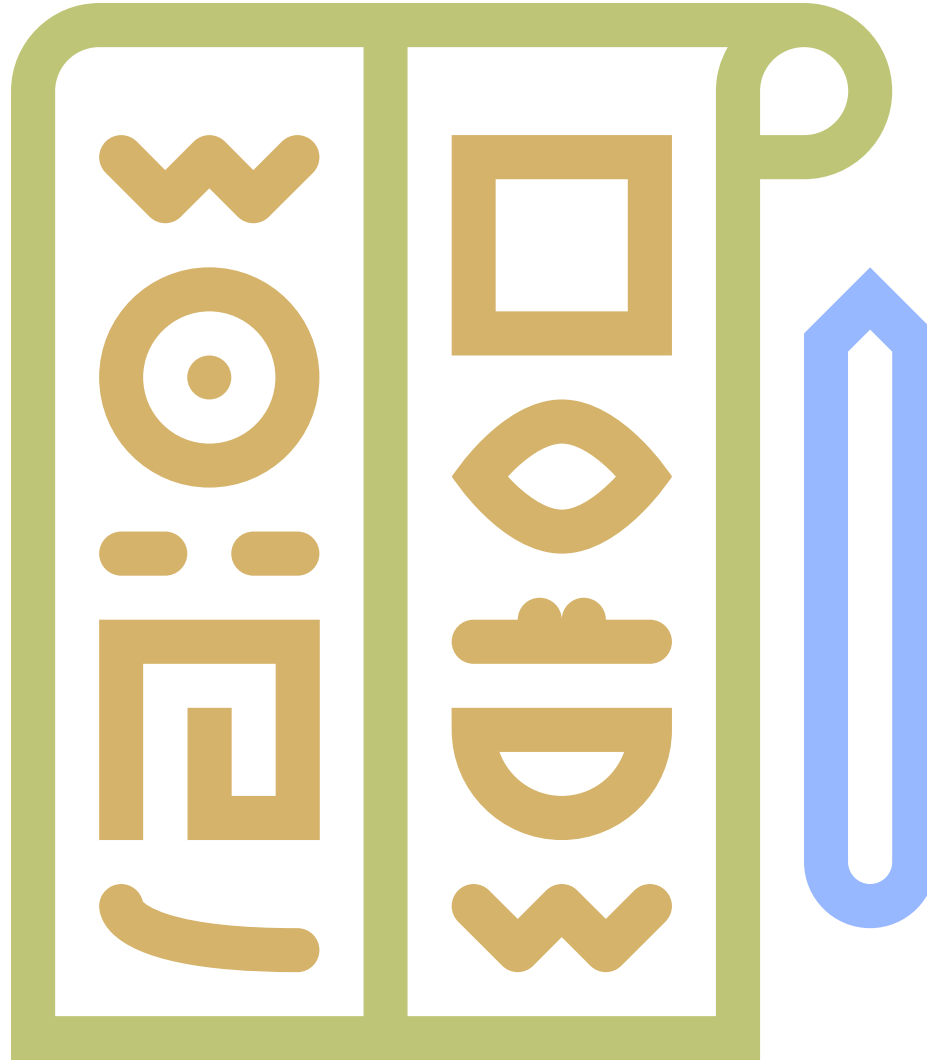
Automated Invention for Smart Industries

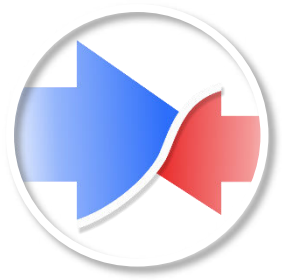
Evgeniy E Smirnov

PhD, Certified
specialist of TRIZ

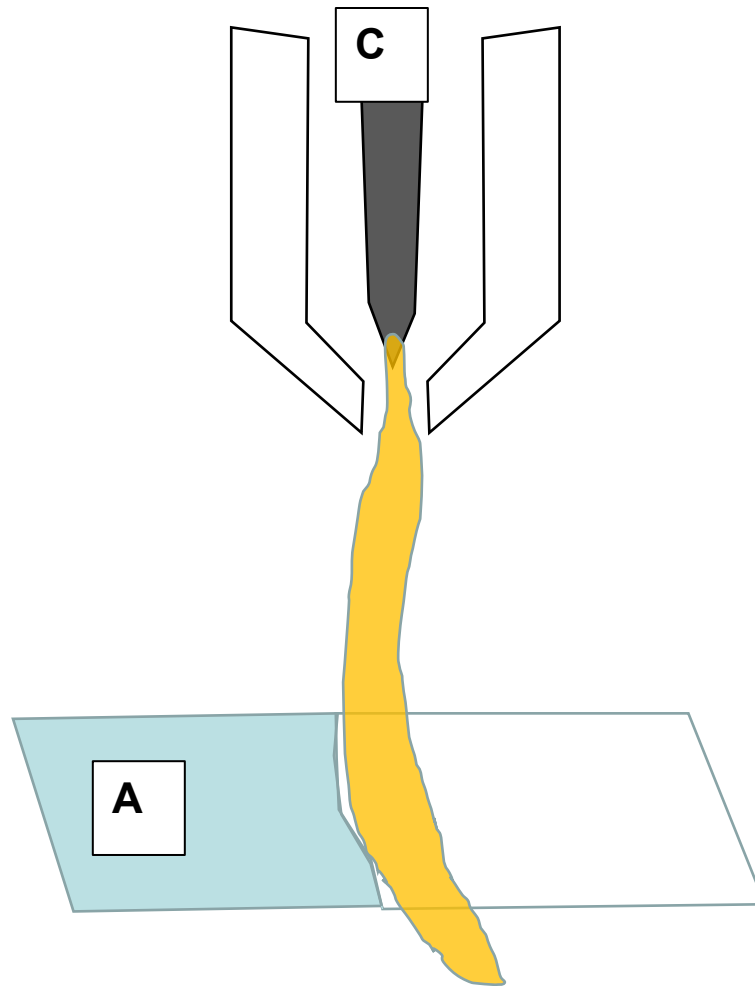


Semantics





Example: cutting arc

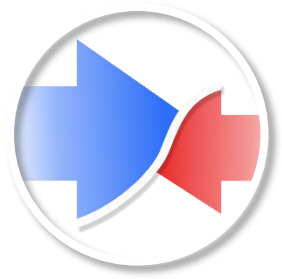




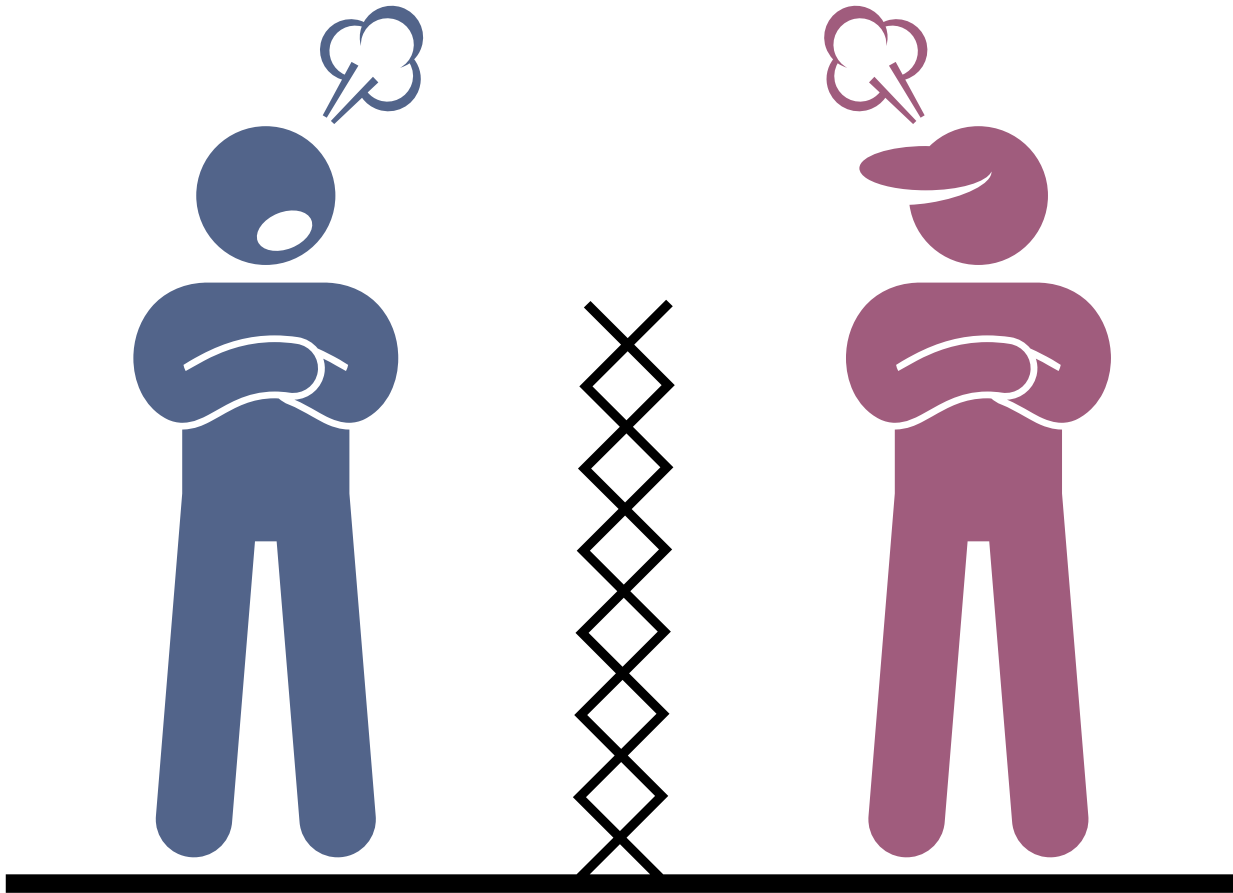
«Ceci n'est pas une pipe»

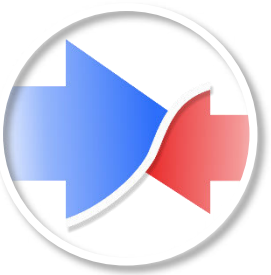


René François Ghislain Magritte, La trahison des images, 1928–1929

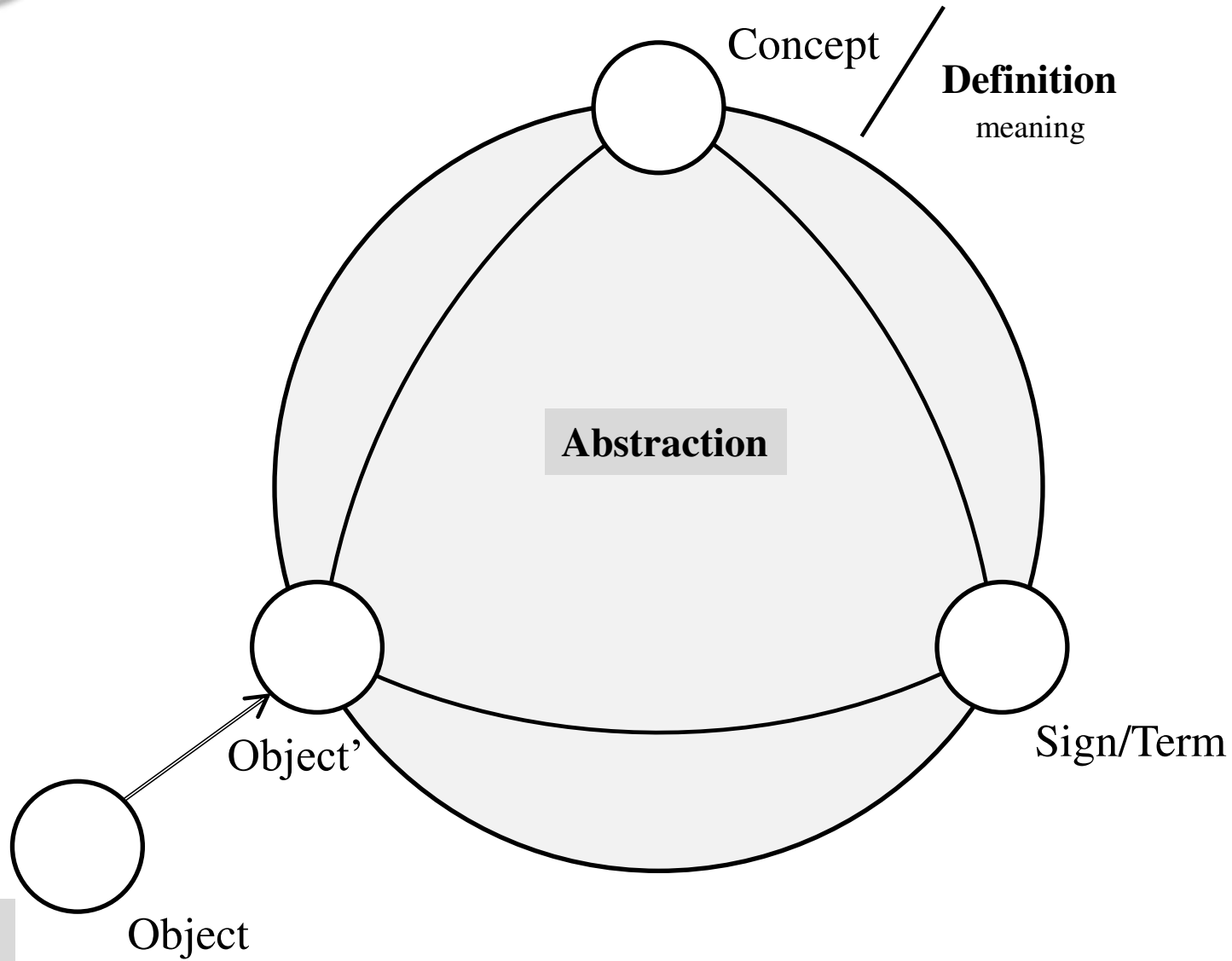


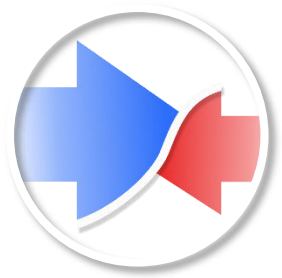
Misunderstanding



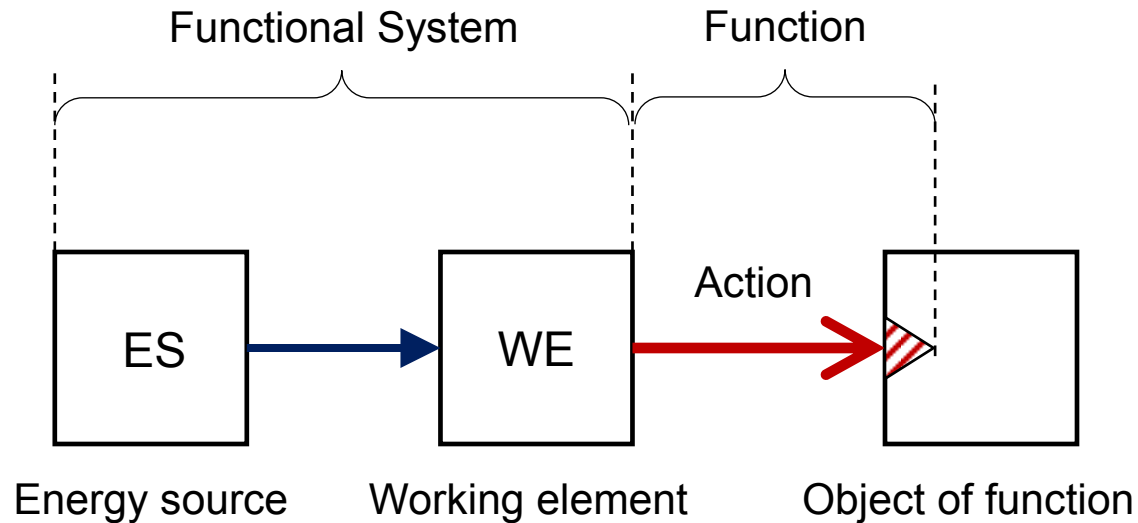


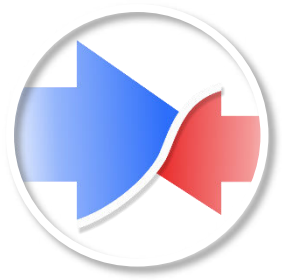
Semantic Triangle



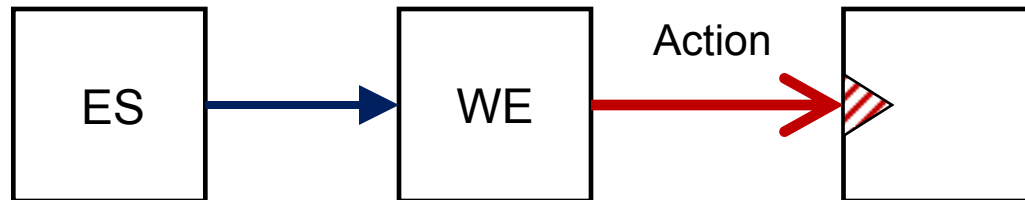
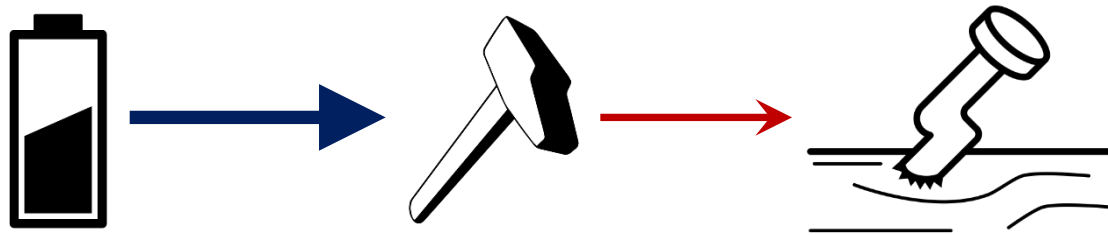


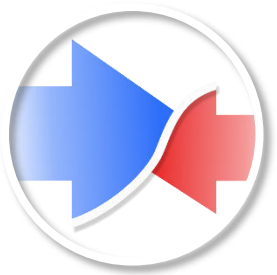
The minimum composition of FS



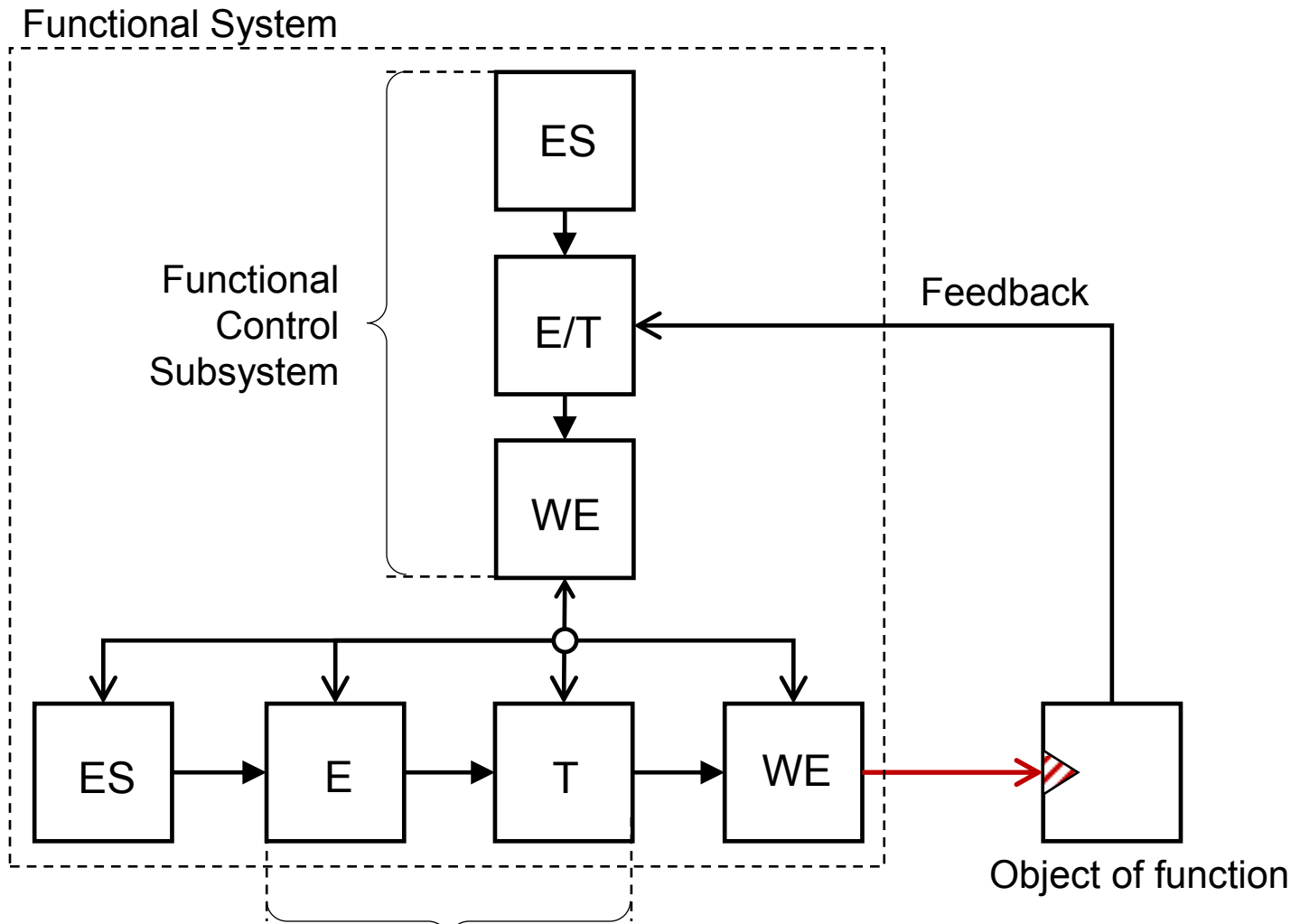


Simplified model of interaction



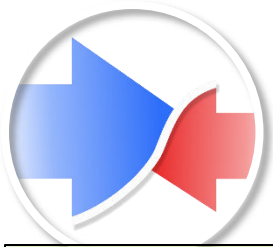


The "Complete" FS



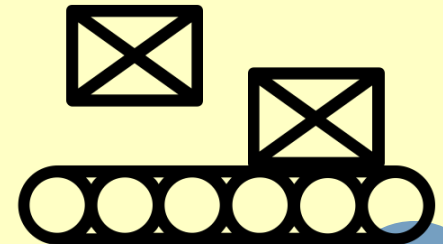
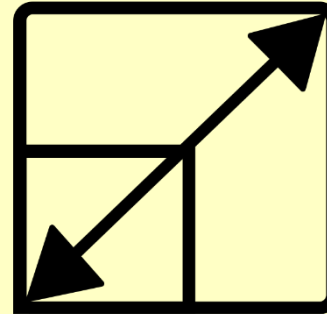
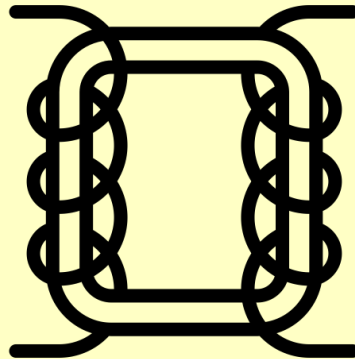
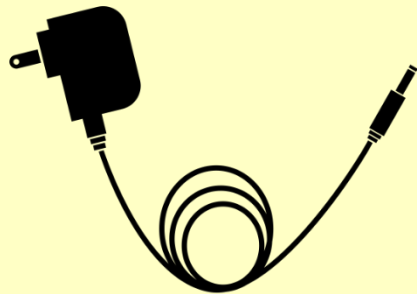
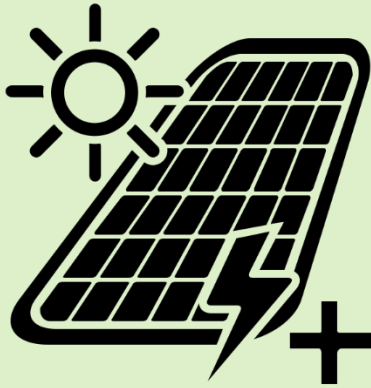
Converters of Energy: 1st kind – “engine” (E)
2nd kind – “transmission” (T)



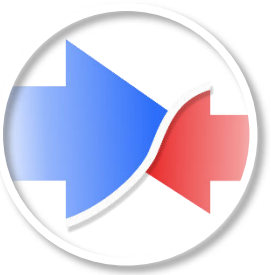


Converters of Energy

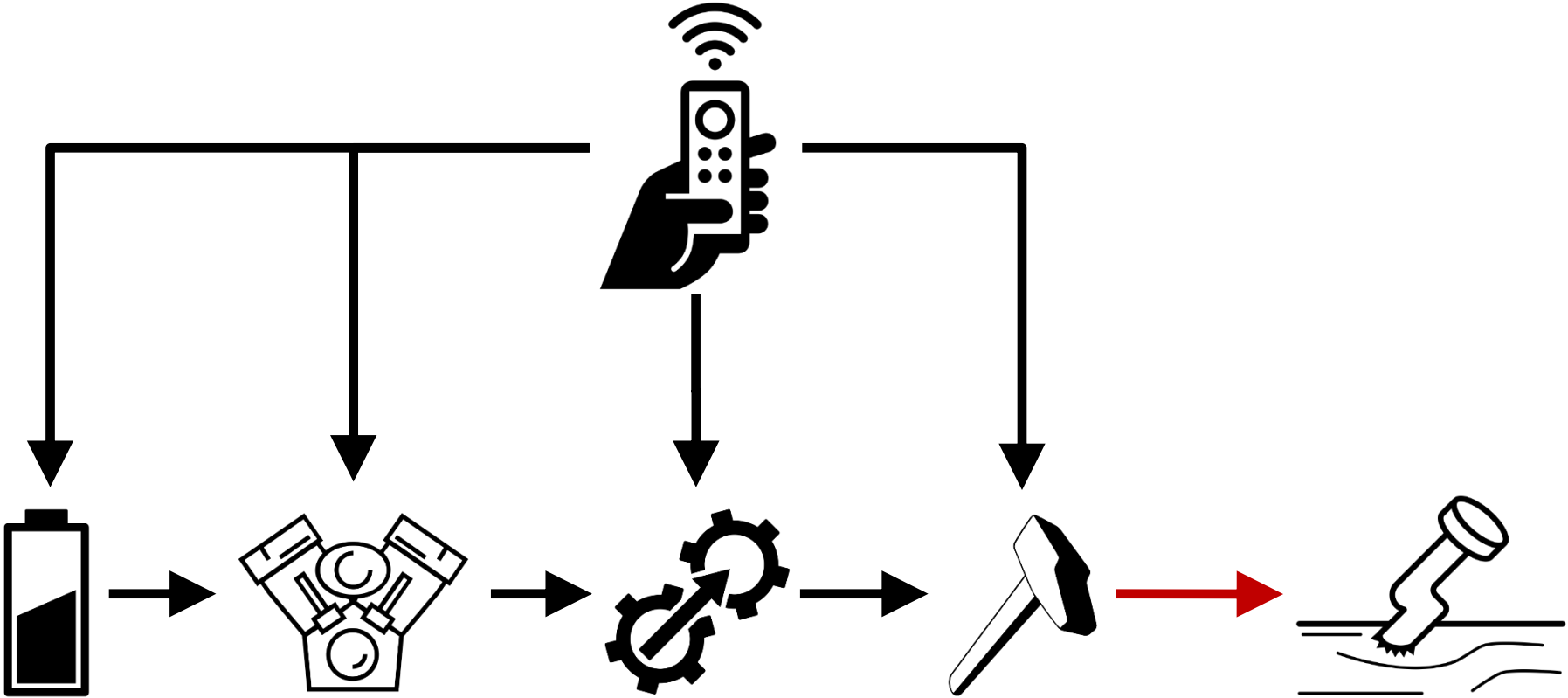
1st kind – “engine” (E)

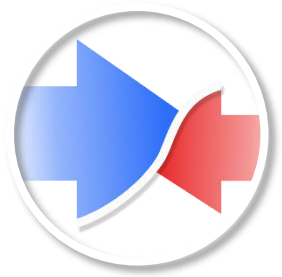


2nd kind – “transmission” (T)

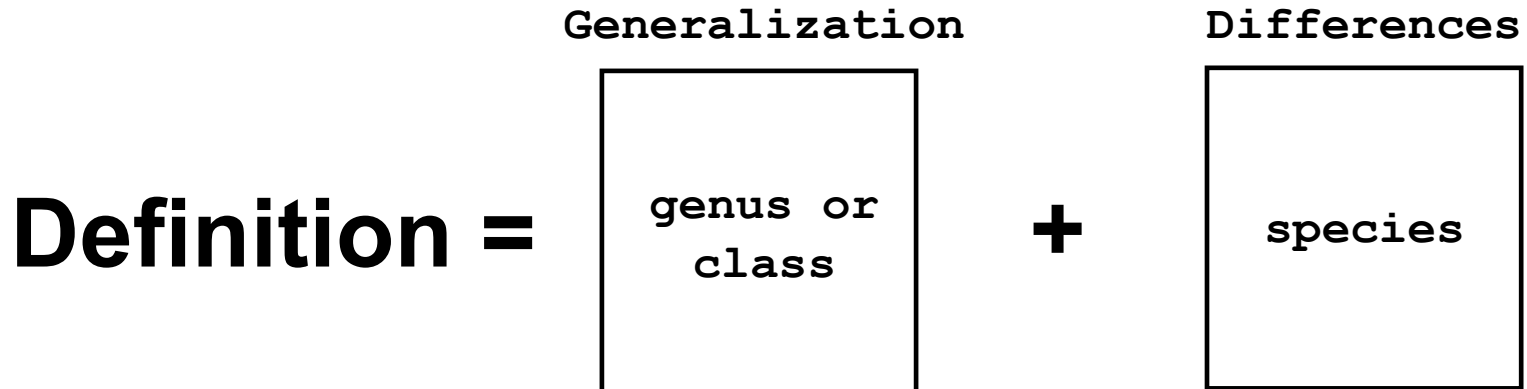


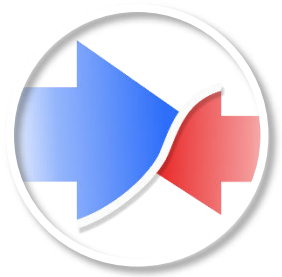
Functional system



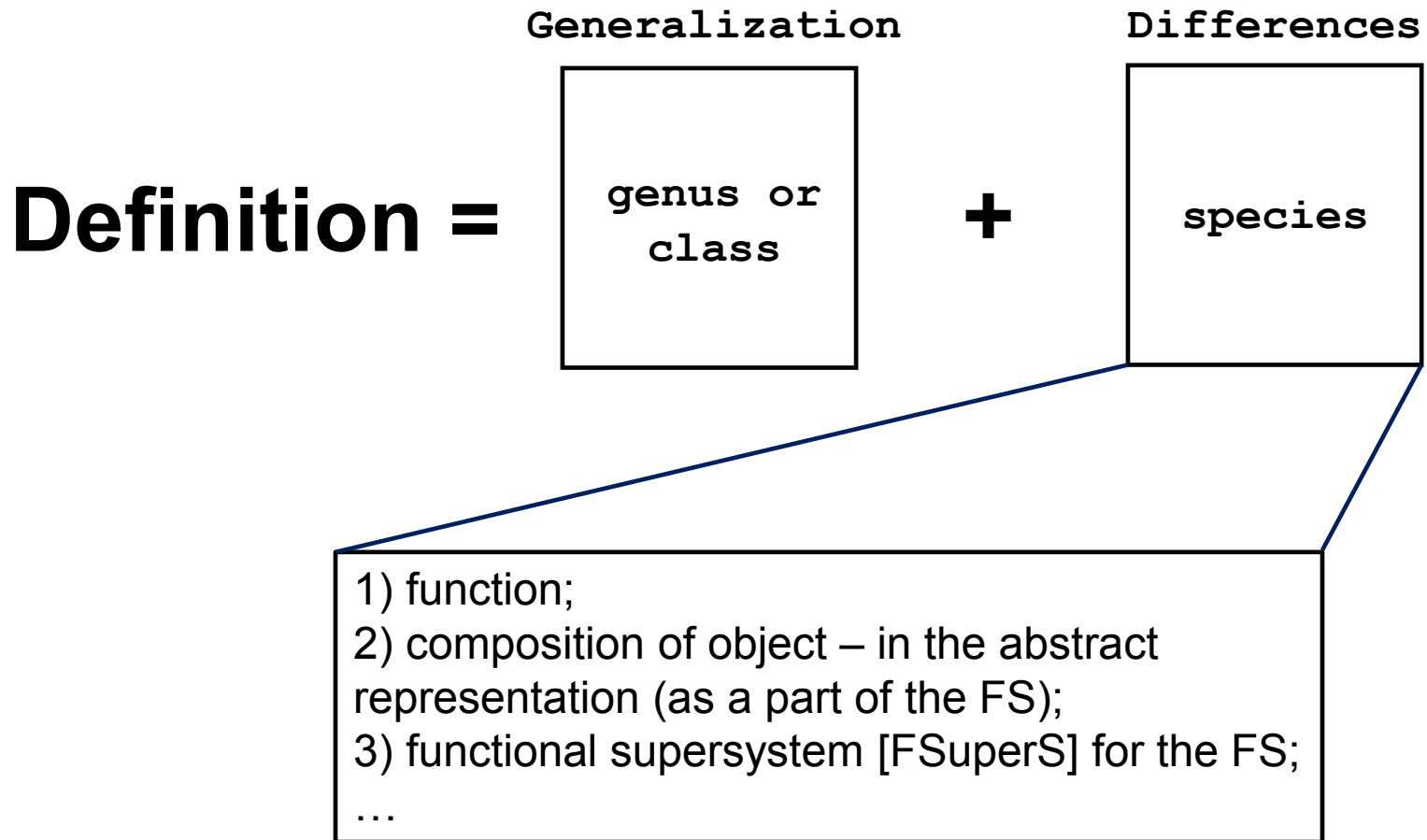


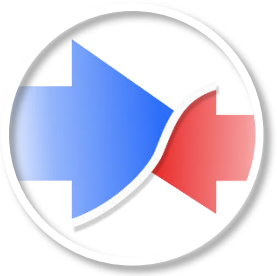
The basis of the formula



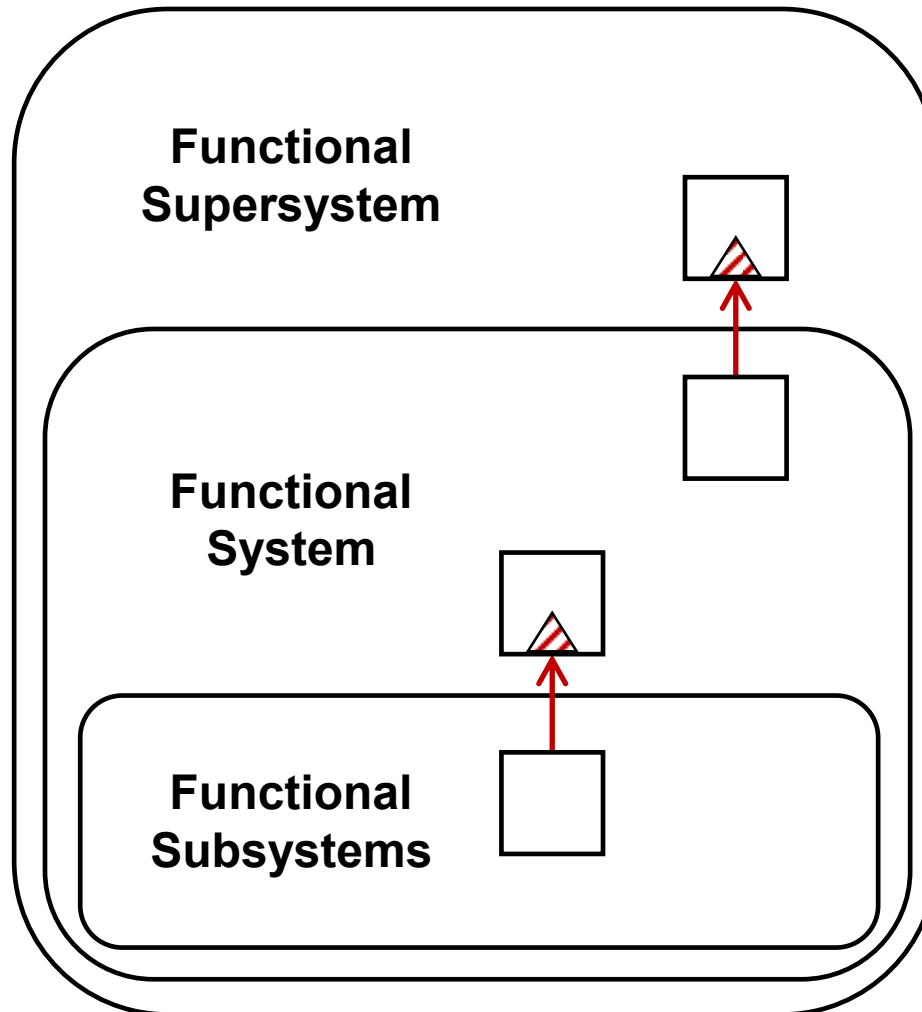


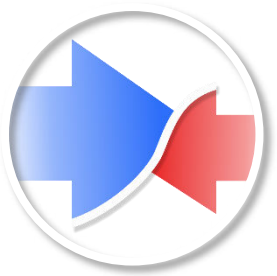
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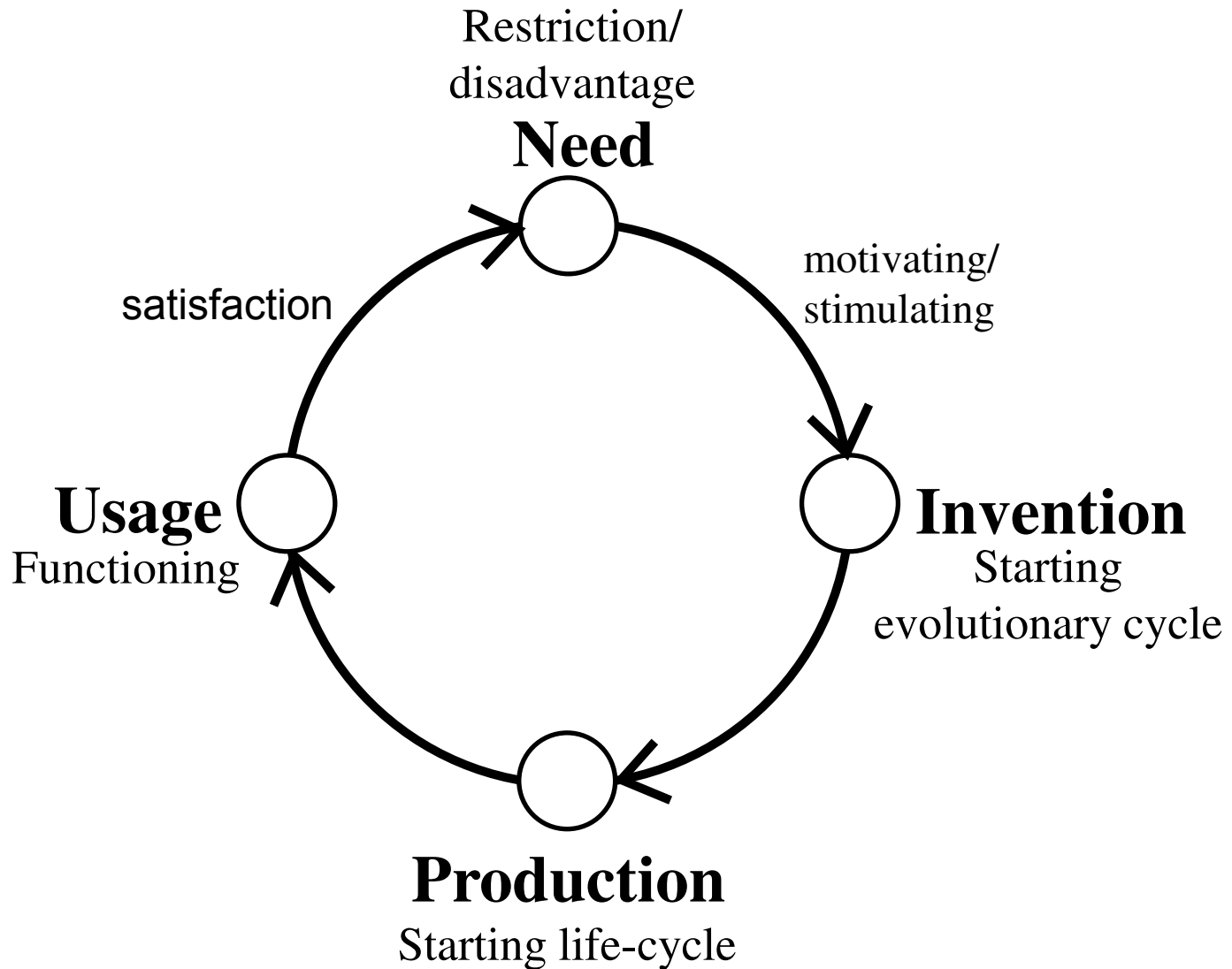


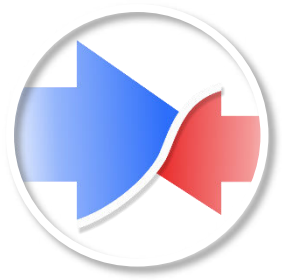
System hierarchy



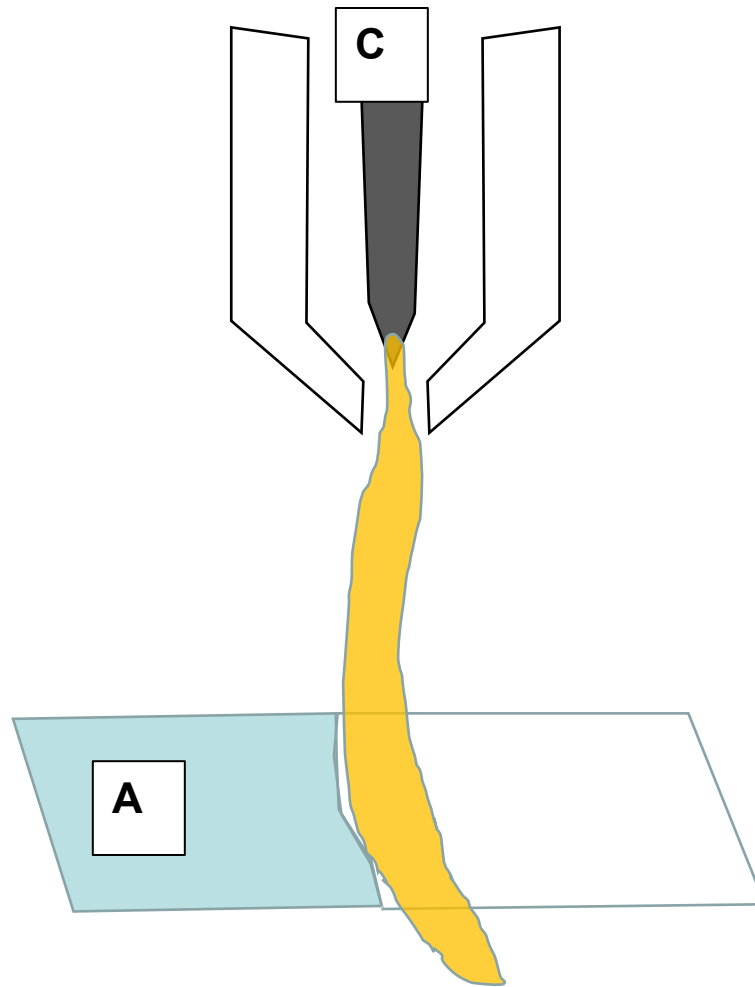


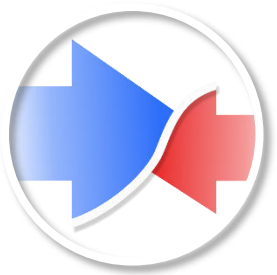
NIPU-cycle





Example: cutting arc

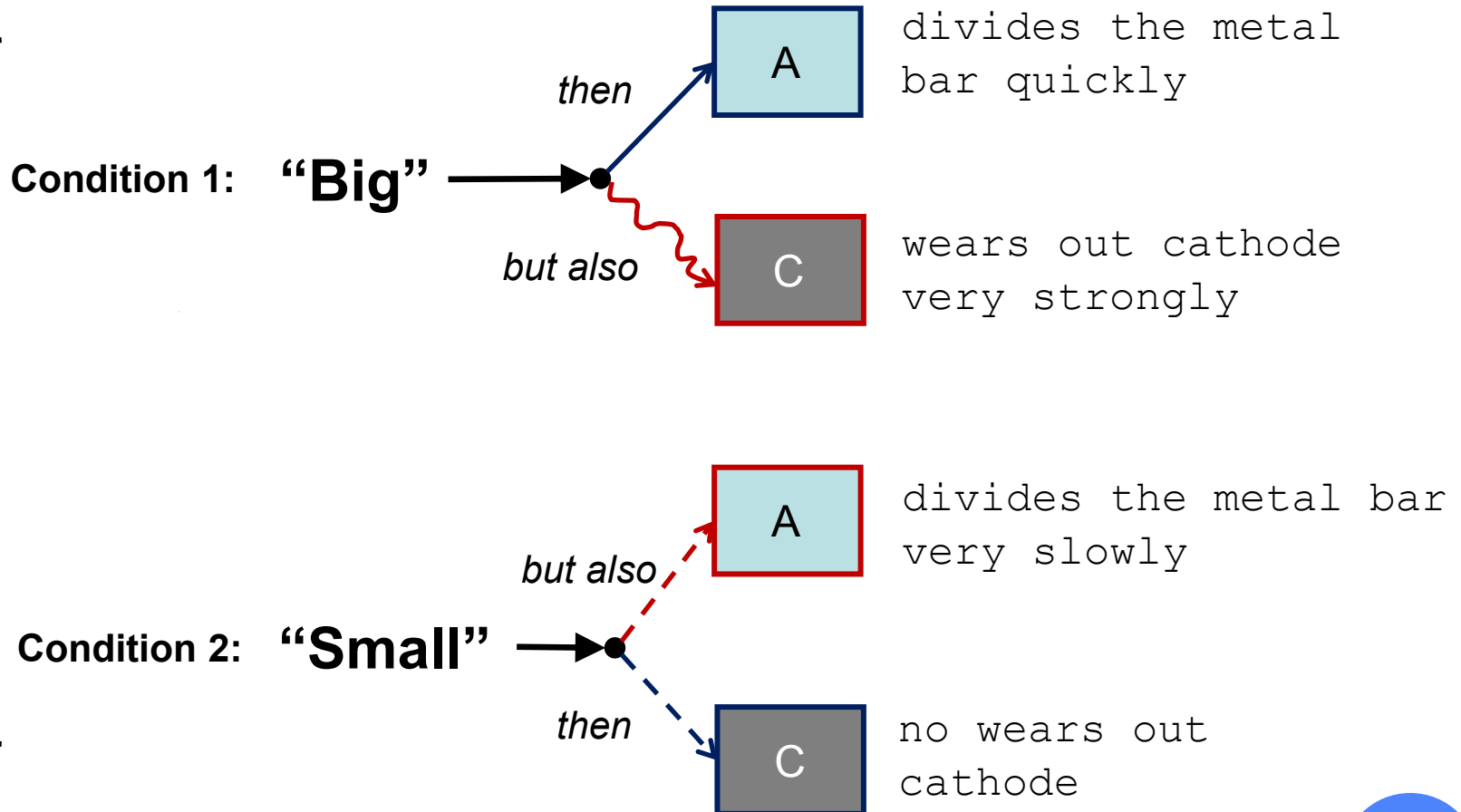


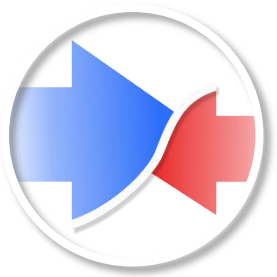


Contradiction of Conditions

Functional definition

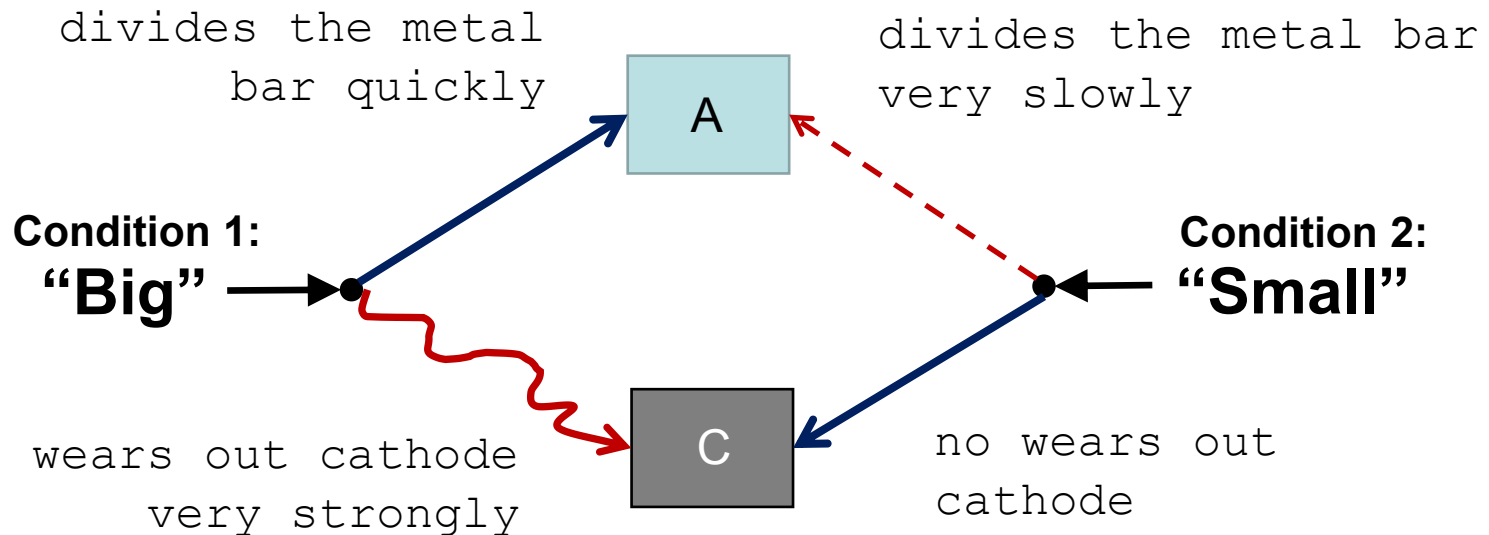
CC

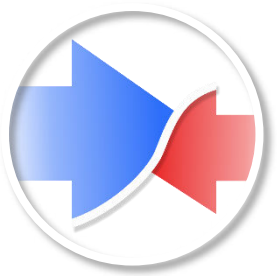




Contradiction of Conditions

Alternative representation

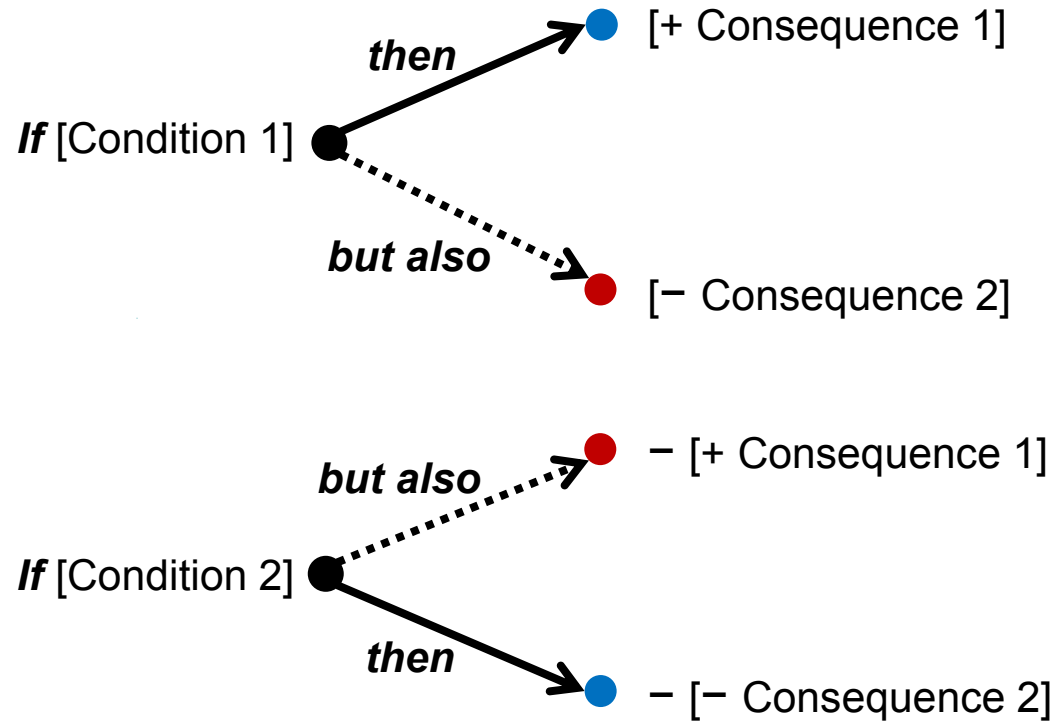


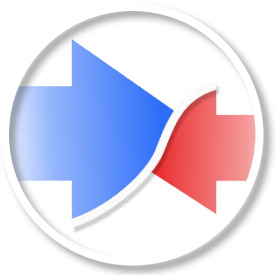


Contradiction of Conditions (CC)

General version

Contradiction
of Conditions





Transition from \mathcal{CC} to \mathcal{CR}

From “if-style” to “must-style”

CC

Condition 1: “Big”

then

A

divides the metal bar quickly

but also

C

wears out cathode very strongly

Condition 2: “Small”

but also

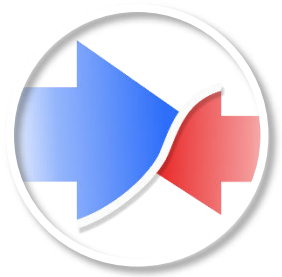
A

divides the metal bar very slowly

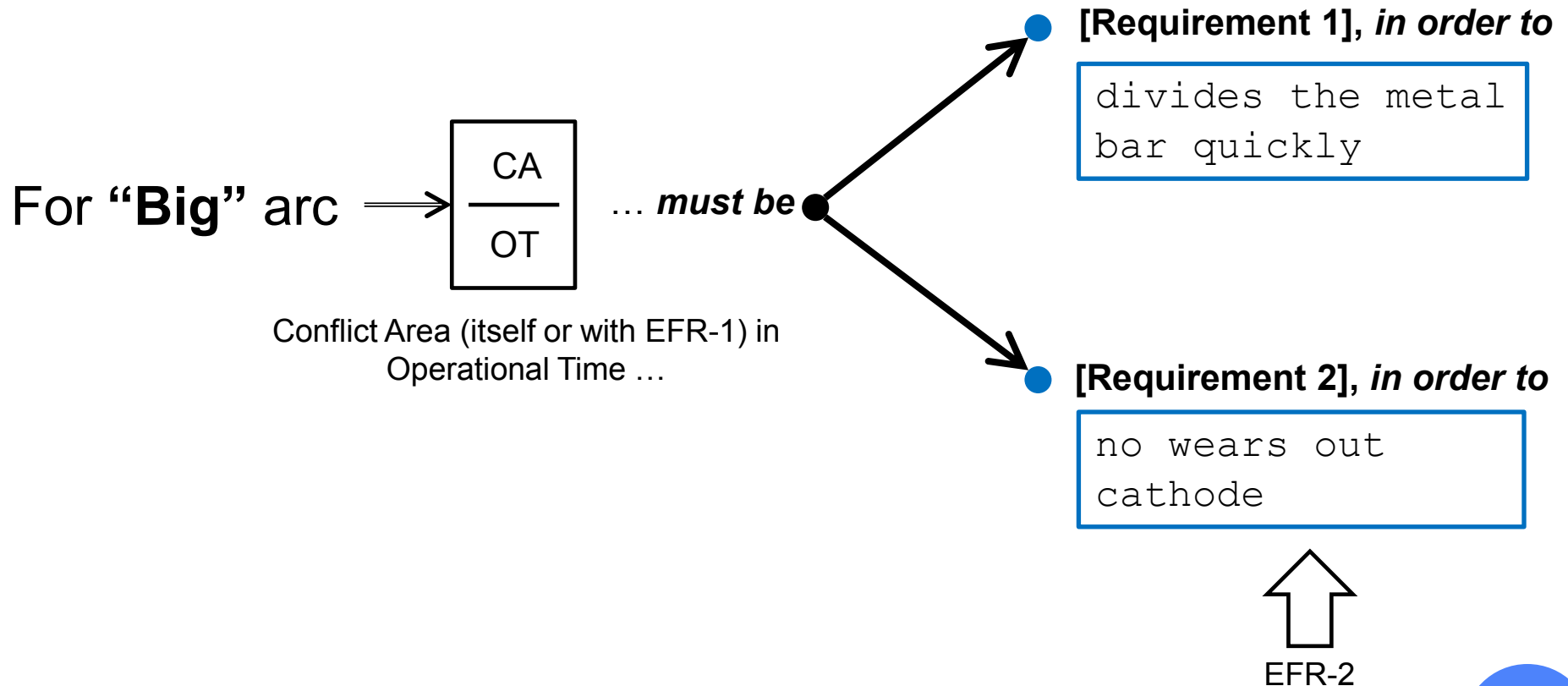
then

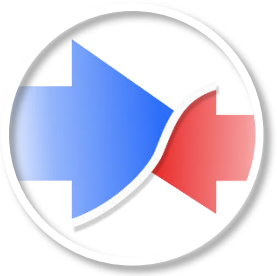
C

no wears out cathode



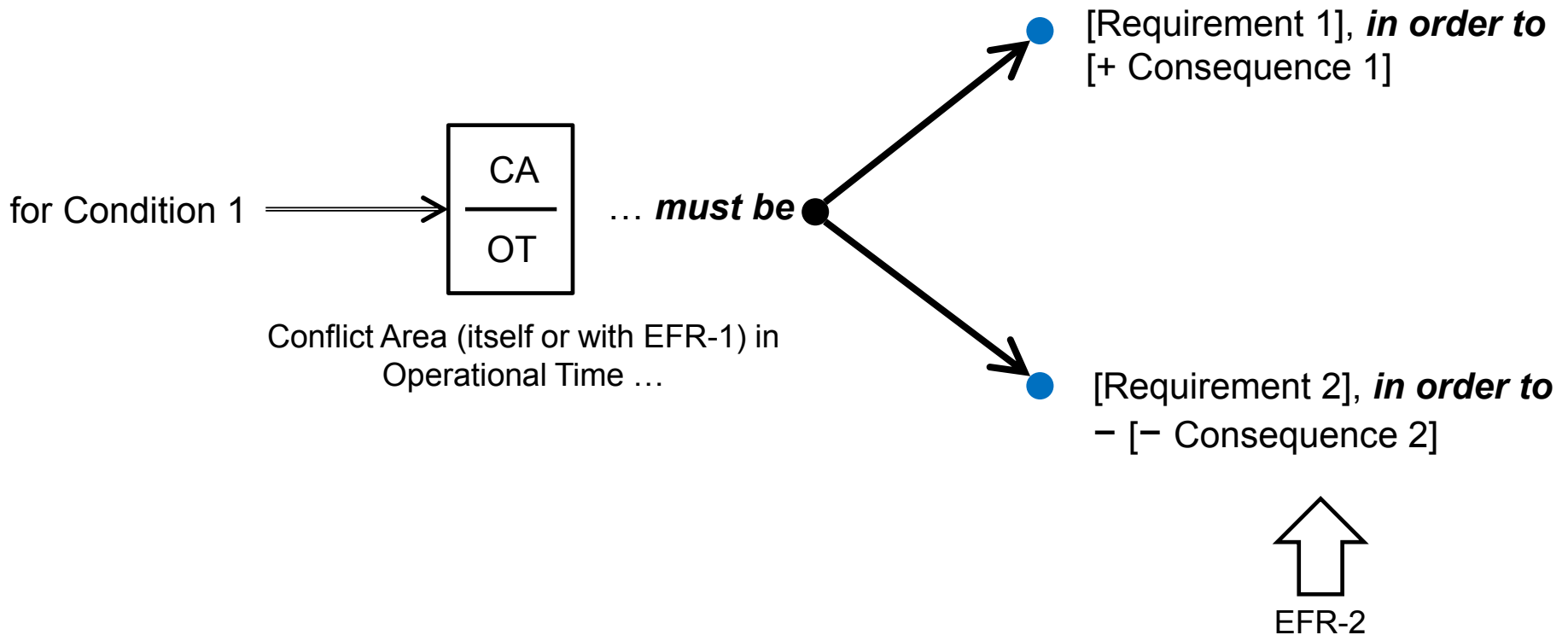
Contradiction of Requirements (CR)

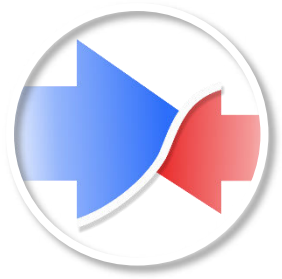




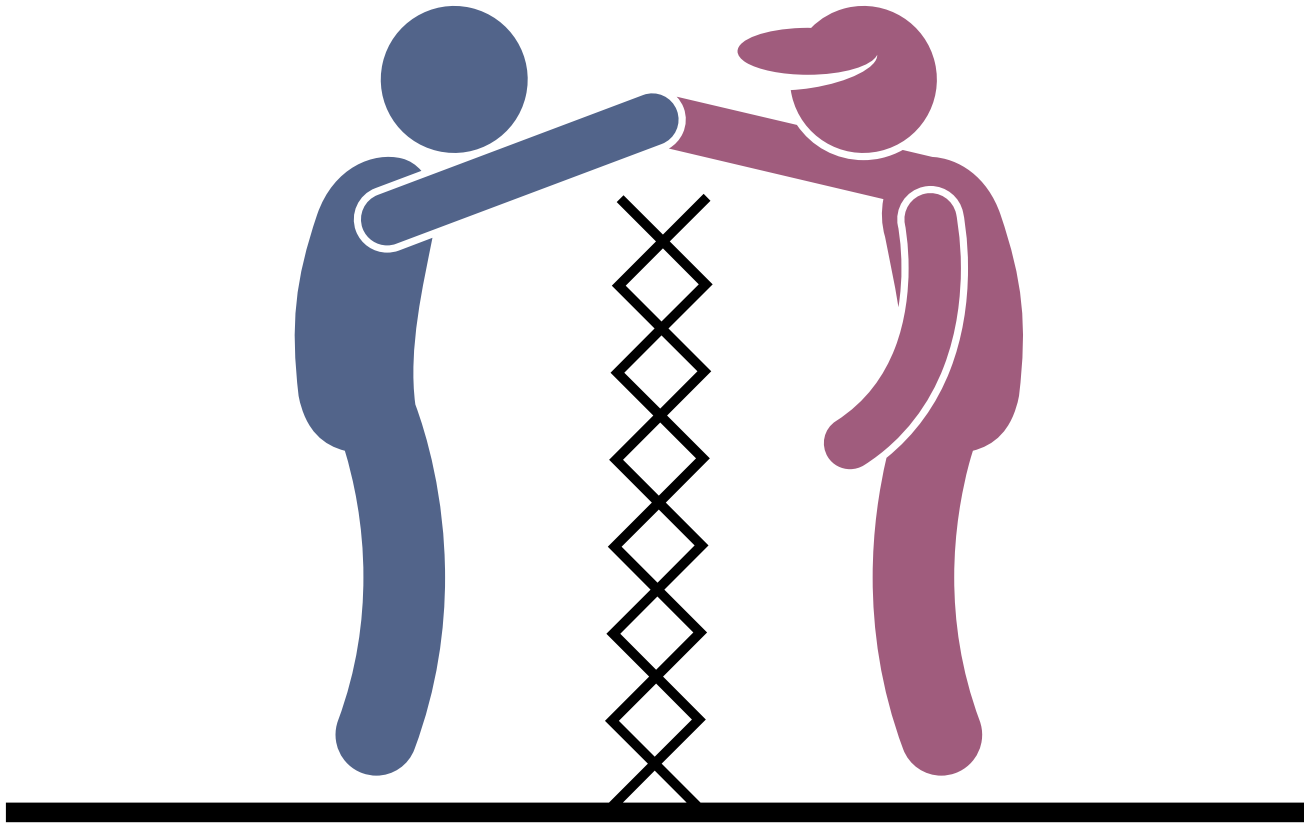
Contradiction of Requirements (CR)

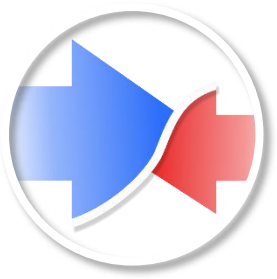
General version



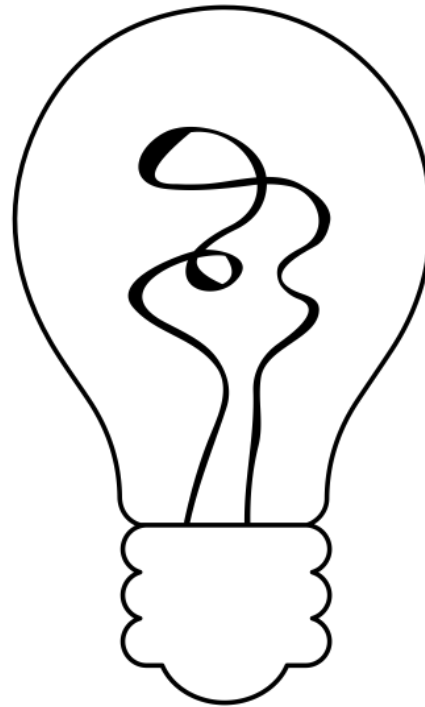


Understanding





*Thank you for your
attention!*



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