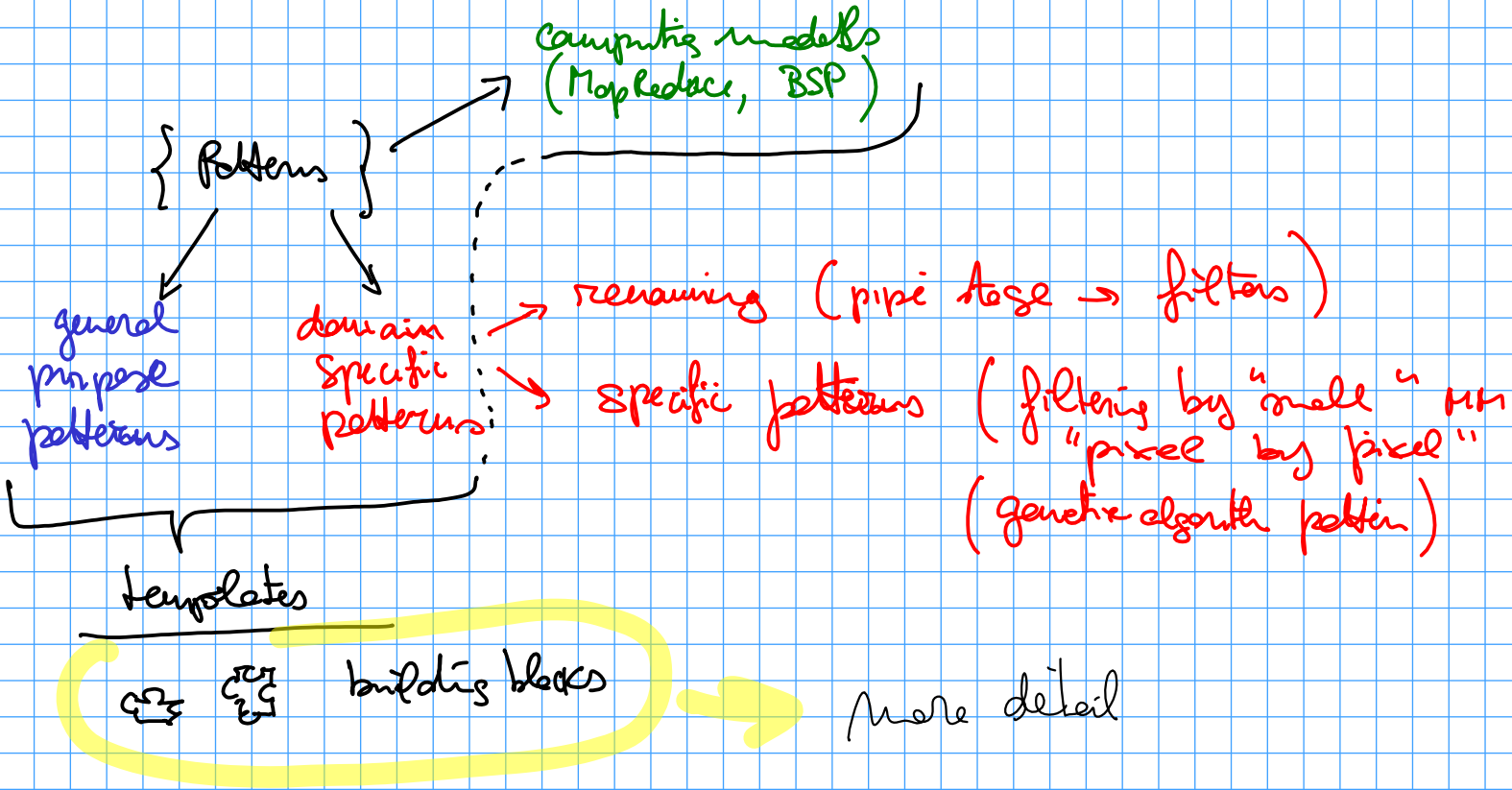
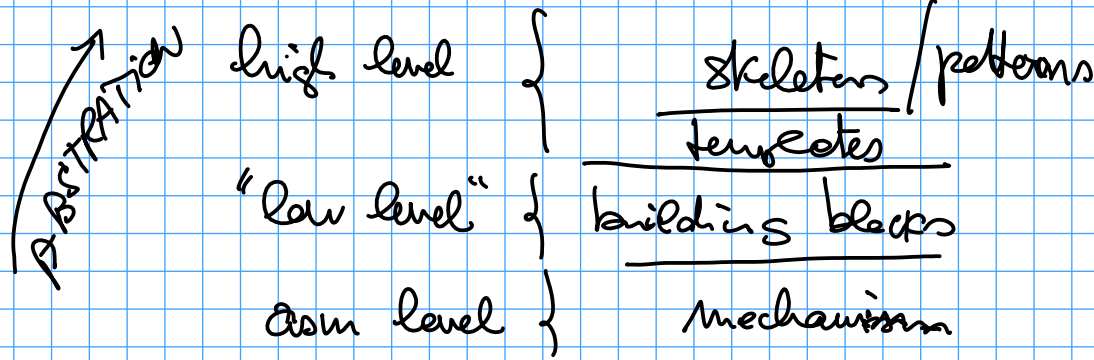


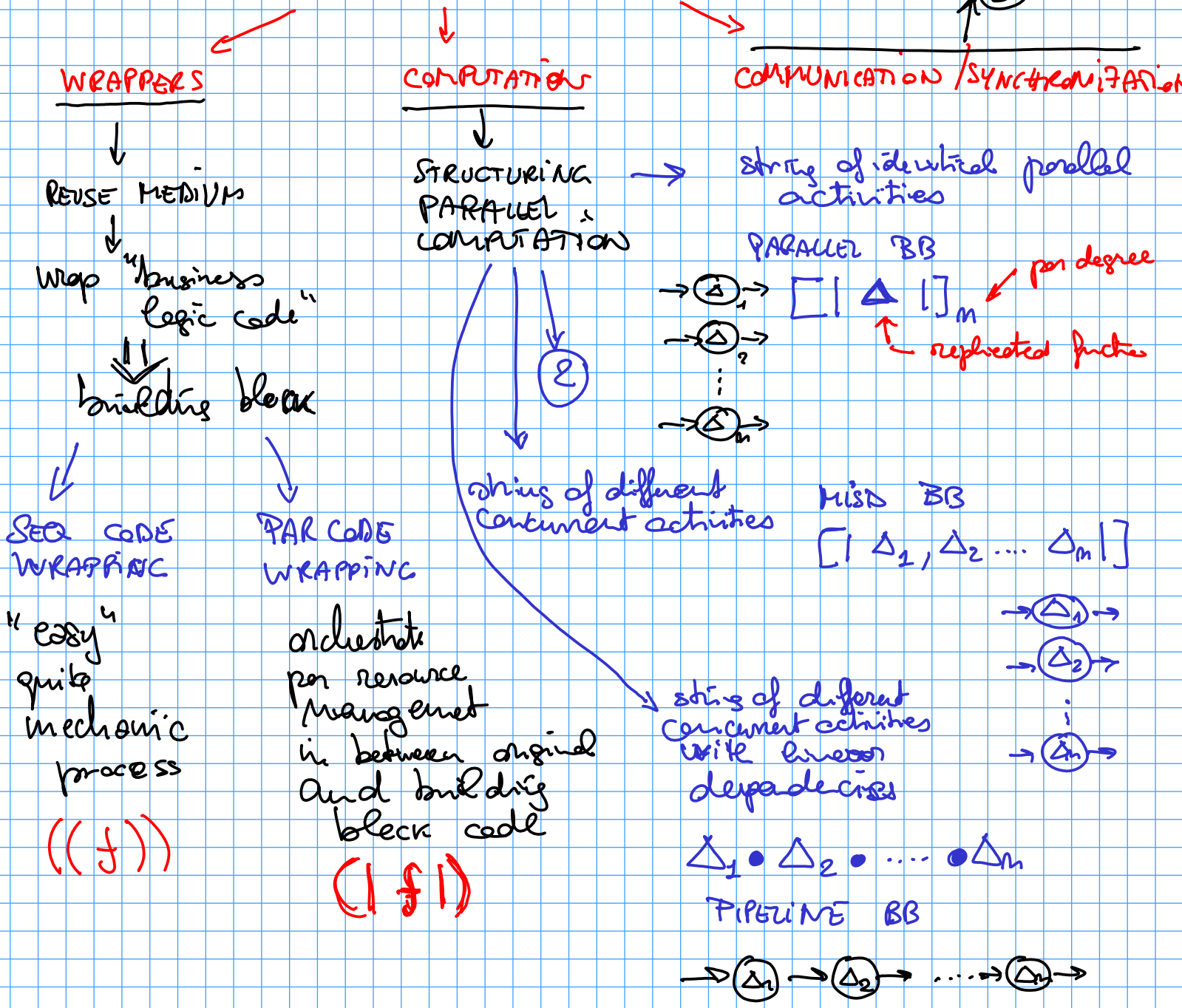
implementations { template based → layered
macro data flow based

skeltons
templates
building blocks





BUILDING BLOCKS Δ

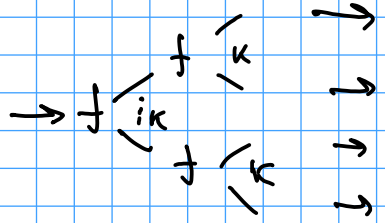


② continued \longrightarrow

SPREAD BB

$(f \triangleleft)$

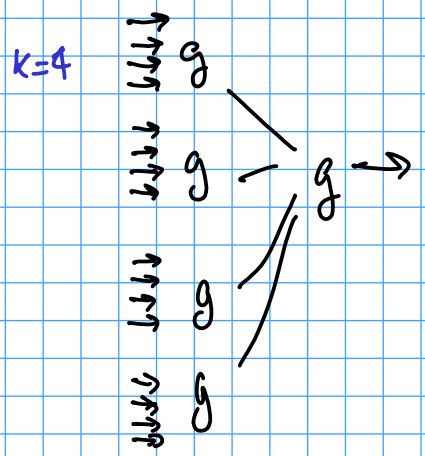
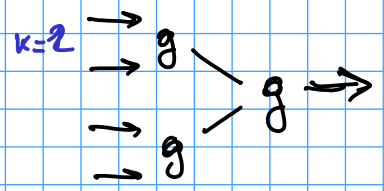
$f: \alpha \rightarrow \alpha^k$



REDUCE BB

$(g \triangleright)$

$g: \alpha^k \rightarrow \alpha$



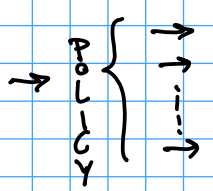
③ COMMUNICATION & SYNCHRONIZATION

1-to-N BB

N-to-1 BB

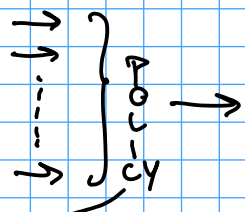
FEEDBACK

\triangleleft policy



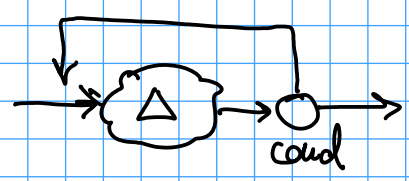
$\{$ Unicast, Multicast, Broadcast $\}$

\triangleright policy



$\{$ Gather, Gather all, Reduce $\}$

(\triangle) cond



COMPOSITION GRAMMAR

$\Delta^n \equiv [\Delta]_n \mid [\Delta_1, \dots, \Delta_n] \mid (\Delta^n)_{\text{cond}} \mid \Delta^n \cdot \Delta^n$

$\Delta^{1n} \equiv \triangleleft \text{policy} \mid (f \triangleleft)$

$\Delta^{n1} \equiv \triangleright \text{policy} \mid (g \triangleright)$

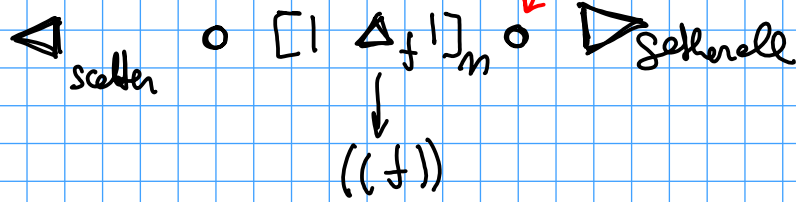
$\Delta \equiv ((f)) \mid (|g|) \mid \Delta \cdot \Delta \mid (\Delta)_{\text{cond}} \mid \Delta^{1n} \cdot \Delta^{n1}$

legal compositions

$\Delta^{1n} \cdot \Delta^n \cdot \Delta^{n1}$

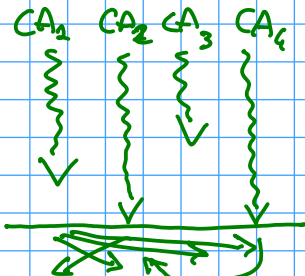
MAP Pattern \rightarrow MAP Template

L pipeline (o)
Computation (o)



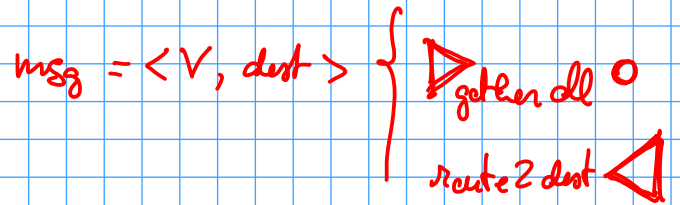
$$[| \Delta_{CA_1} | \Delta_{CA_2} | \Delta_{CA_3} | \Delta_{CA_4} |]$$

BSP
 SS_i

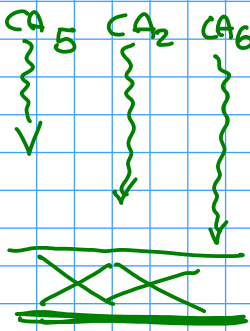


barrier

communication

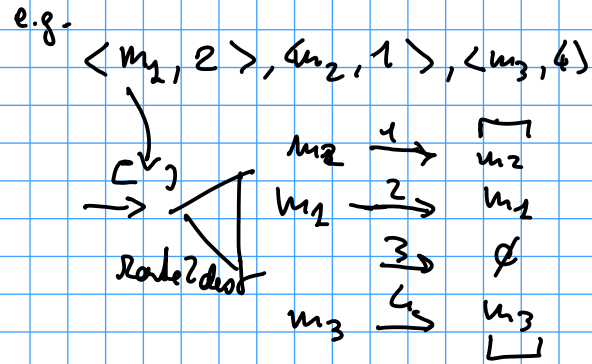


SS_{i+2}

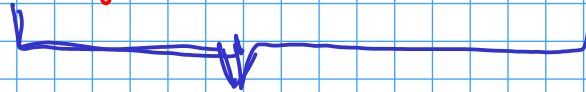
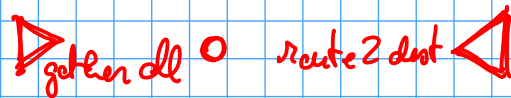


barrier

communication



$$Superstep_i \equiv [| \Delta_{CA_1} | \Delta_{CA_2} | \Delta_{CA_3} | \Delta_{CA_4} |] \circ$$

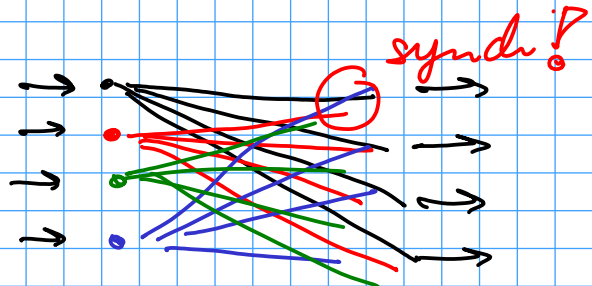


from data flow analysis of the computation

\Rightarrow I understand I can move the barrier "away" to forward the barrier to the end of the computation

$$[| (route 2 dest \triangleleft) |]$$

Reinsert the barrier



↓
▷ general ◯ ◁ scatter
└──────────────────┘
before list of bones

but may be updated
with any available
bones mechanism I have