

Limits of Model Transformations for Embedded Software

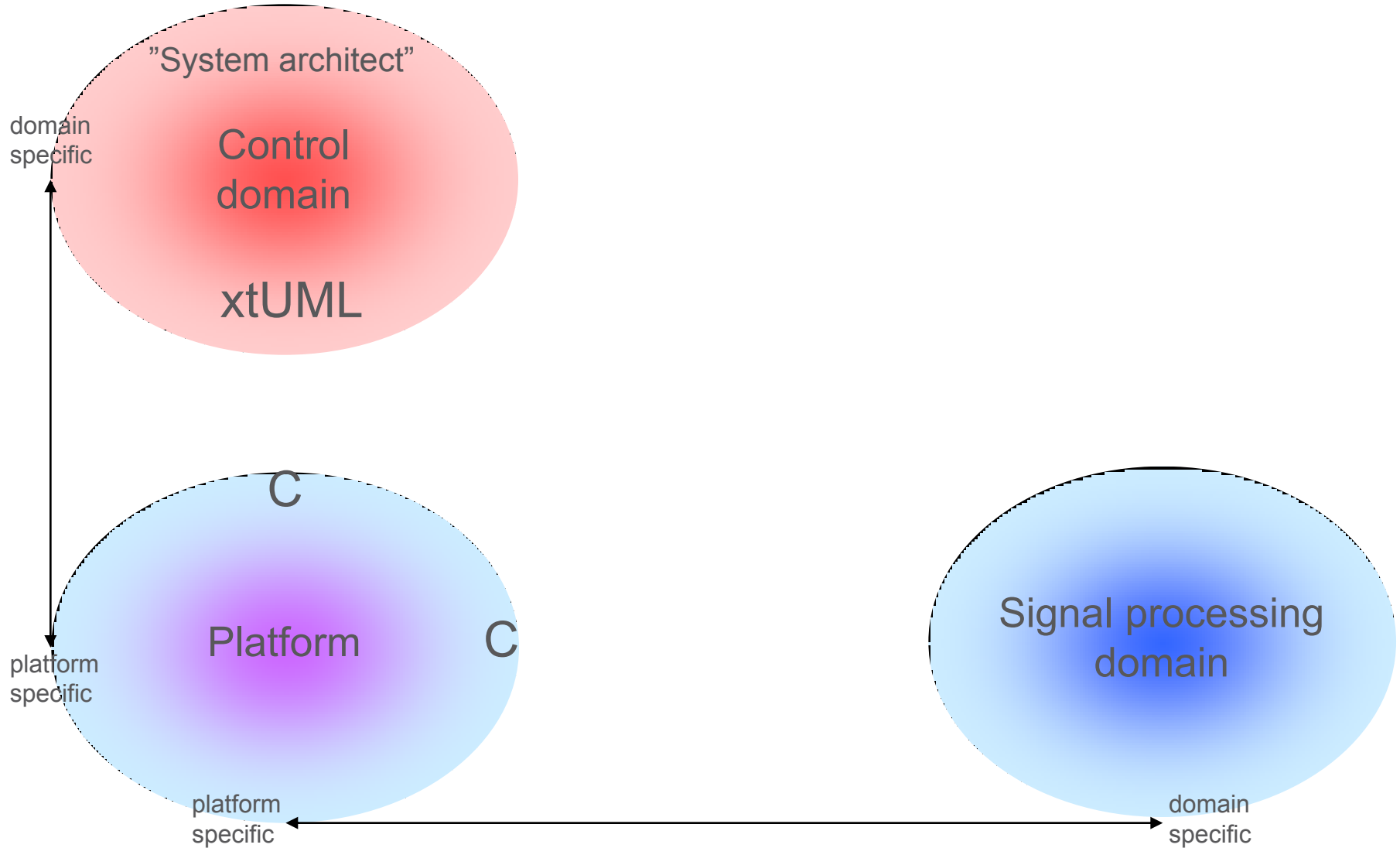


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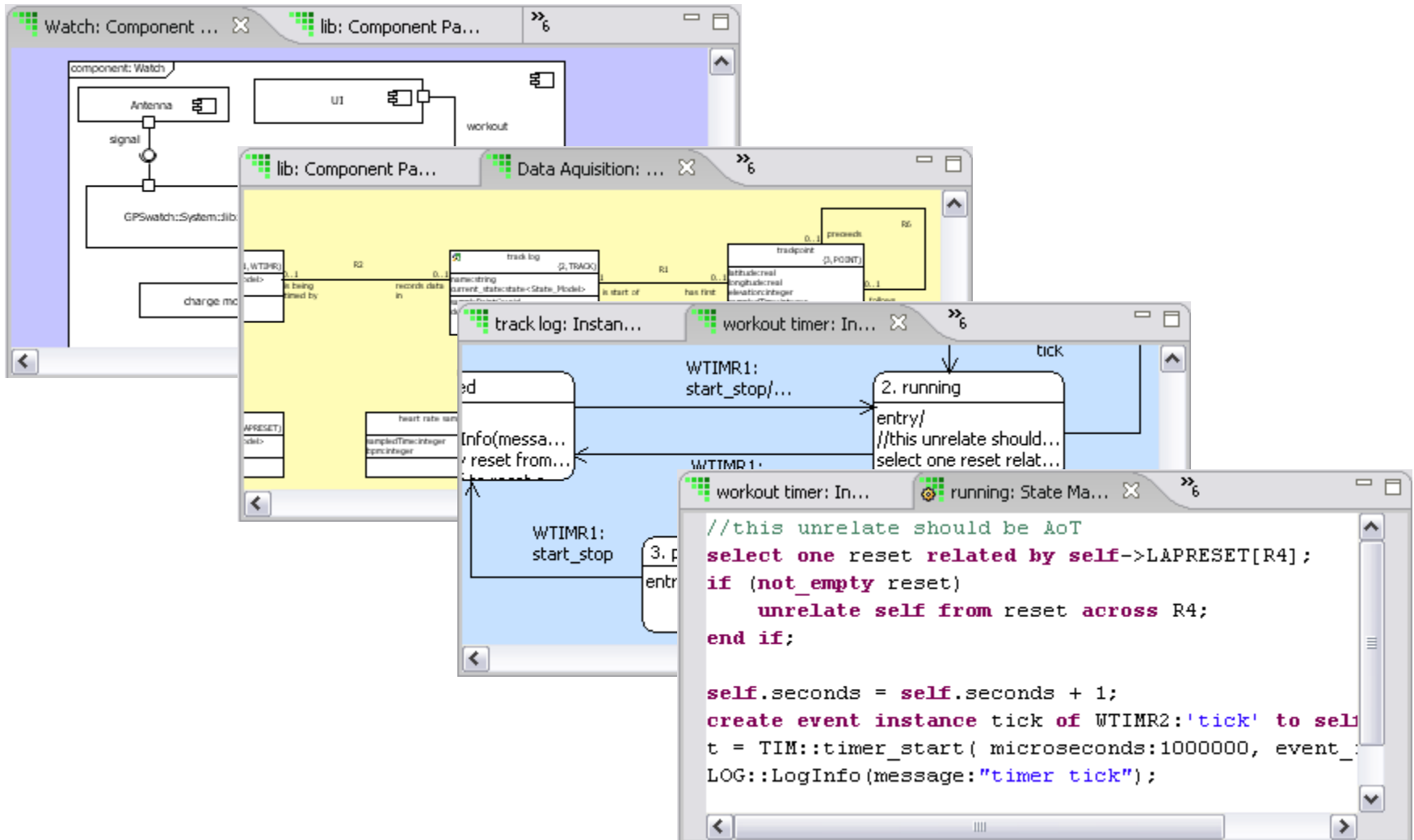
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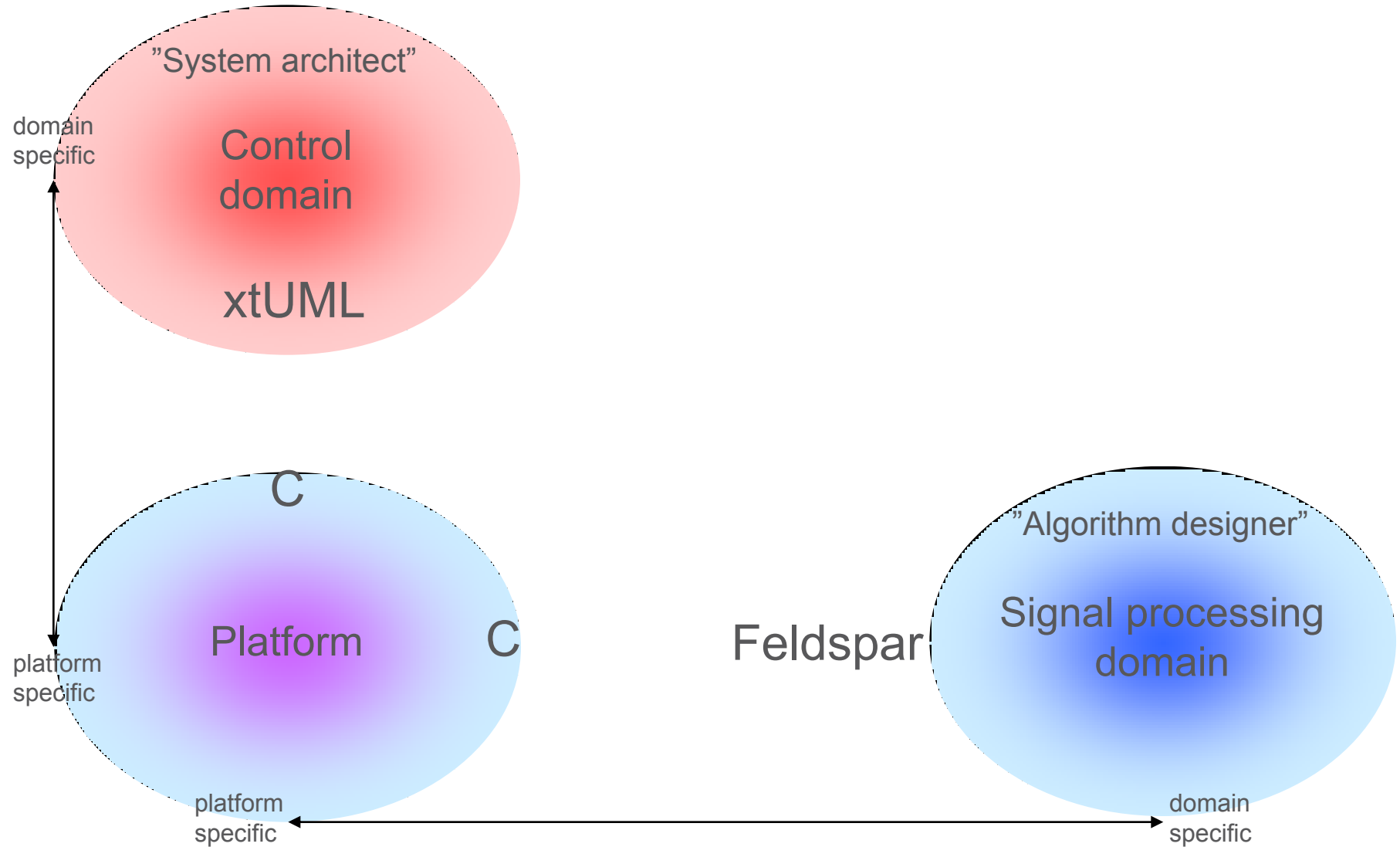
Divide and conquer



Executable and Translatable UML



Divide and conquer



Feldspar

$$\text{DCT-2}_n = \left[\cos \frac{k(2l+1)\pi}{2n} \right]_{0 \leq k, l < n}$$

dct2 :: DVector Float -> DVector Float

dct2 xn = mat ** xn

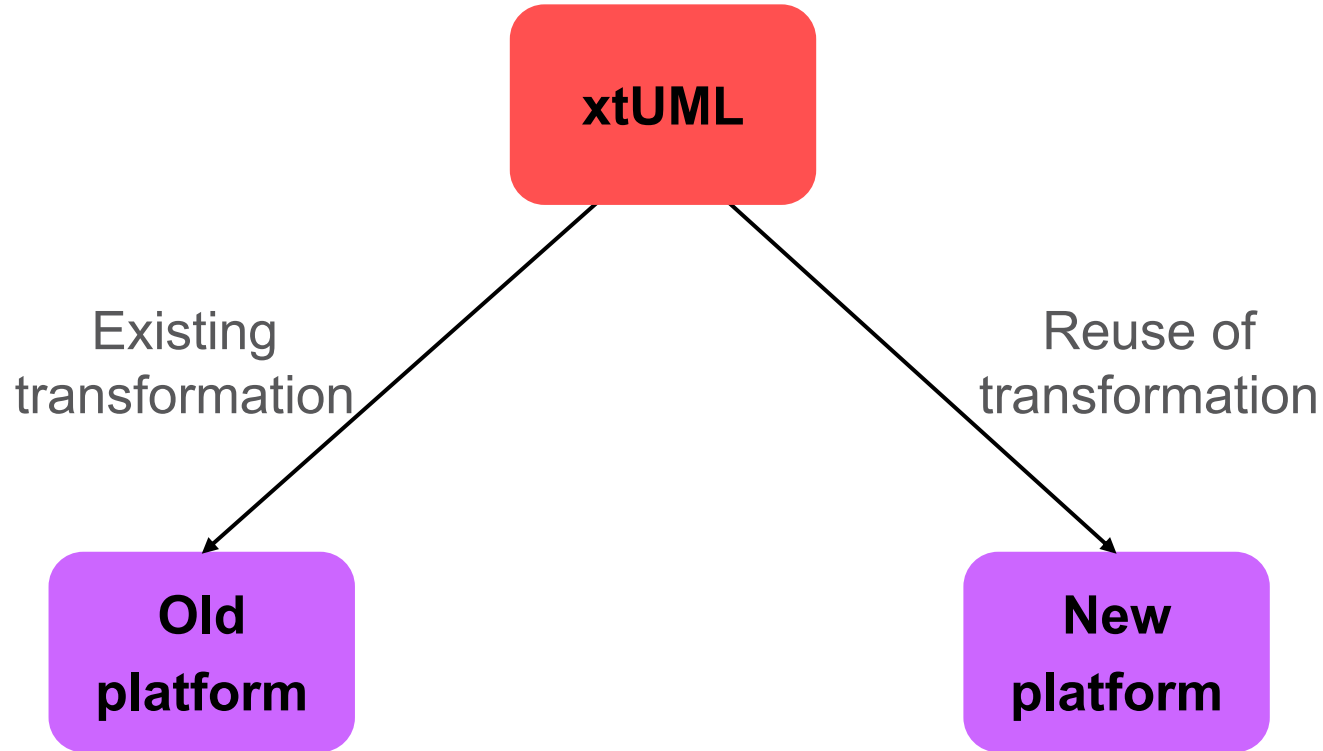
where mat = indexedMat (length xn) (length xn)

(\k l -> dct2nkl (length xn) k l)

dct2nkl n k l = cos ((k'*(2*l'+1)*3.14)/(2*n'))

where (n',k',l') = (intToFloat n, intToFloat k, intToFloat l)

xtUML → C

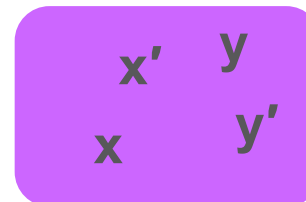


Feldspar \rightarrow C

Feldspar



Platform



Lessons learnt

- Organisation
- Education
- Transformations \neq Compilers
- Domain-Specific Languages