

# Potentialities

A potentiality is a sequence of states that a system could pass through. It also encodes the potential change of state if it communicates with the exterior world.

```
open import PredP
open Pred

module PotP (Msg :  $\mathcal{U}$ )  $\mathcal{V}$  (Cm : Pred (Pred Msg  $\mathcal{V}$ ) ( $\mathcal{U} \sqcup \mathcal{V}$ ))  $\mathcal{W}$  (Cp : Pred ( $\Sigma$  Cm)  $\mathcal{W}$ )
where

  open import FCP { $\mathcal{W} = \mathcal{U} \sqcup \mathcal{V} + \sqcup \mathcal{W}^+$ } Msg  $\mathcal{V}$  Cm

  open  $\Sigma$ Pred
```

BSet is a predicate on the messages that are received or accepted by a system.

&PSet is an abstract structure of the system, that will be used to check if the system reduces.

```
BSet =  $\Sigma$  Cm
&PSet =  $\Sigma$  Cp
```

```
open import FunctorP
open import Final-CoAlgebraP
```

```
Fpot : Functor ( $\mathcal{U} \sqcup \mathcal{V} + \sqcup \mathcal{W}^+$ )
Fpot =
  (  $\lambda$  X  $\rightarrow$  X  $\times$  &PSet  $\times$  FC X )
, (  $\lambda$  f (  $\times$  , &ps , ((mp , fm) , (ap , fa)))  $\rightarrow$ 
    f x , &ps , (mp ,  $\lambda$  x c  $\rightarrow$  f (fm x c)) , (ap ,  $\lambda$  x c  $\rightarrow$  f (fa x c)))
, (  $\lambda$  f g x  $\rightarrow$  refl )
,  $\lambda$  x  $\rightarrow$  refl
```

```
Pot = Final-CoAlgebra Fpot
```