

e-Motions re-implementation of Palladio

-- *Evaluation* --

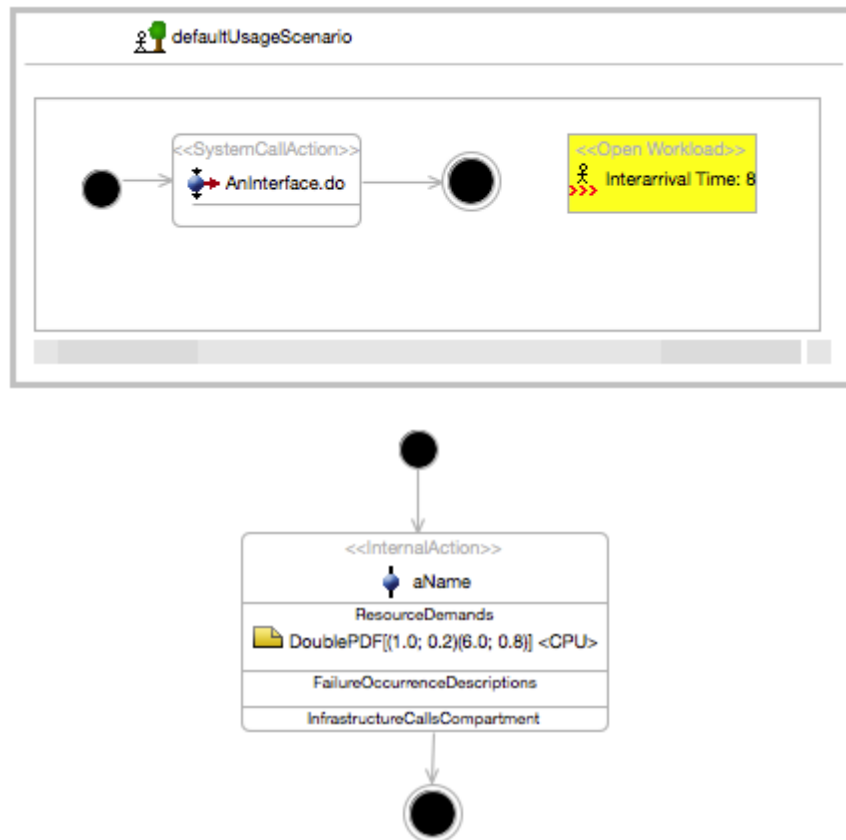
Version 3.0

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TestDoublePDF

The TestDoublePDF example checks whether the e-Motions implementation of such expression matches the Palladio's one.

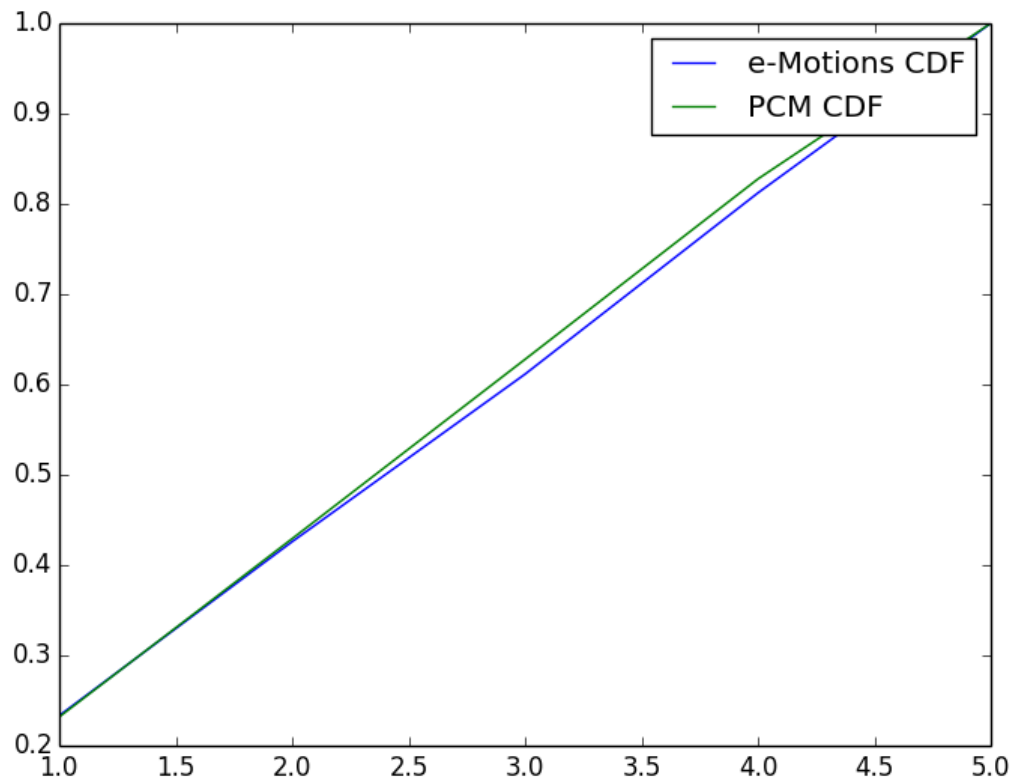
The very simple examples is like this:



And with the following results to the non-saturation executions:

```
*****
**** For OpenWorkload = 8.0 (without saturation) || 1000 t.u.
*****
--> Reading file  MaudeResults/result_8000tu.txt
--> Reading file  PalladioResults/result_8000tu_ow_8.csv
size of the sample
# size:      1000
e-Motions data analysis:
# mean:      2.86809875
# st dev:    1.75159328611
PCM data analysis:
# mean:      2.86735012578
# st dev:    1.77211023166
(0.022000000000000002, 0.96724415186649837)
```

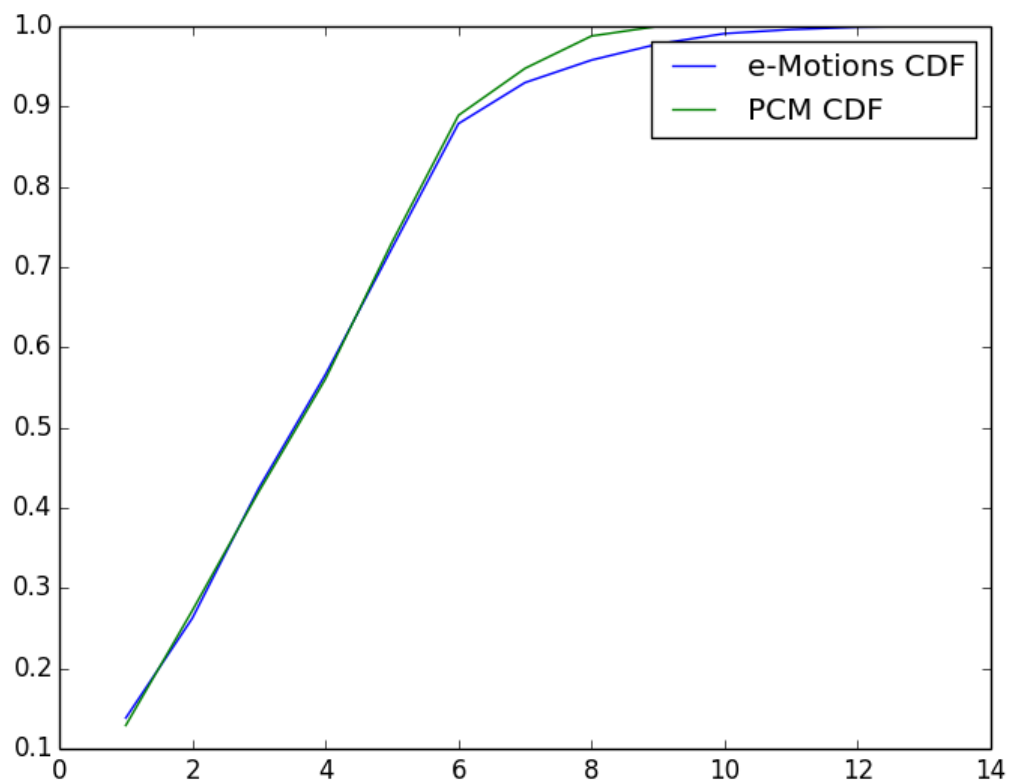
And with CDF plot:



With saturation (i.e. with OpenWorkload rate = 4.0):

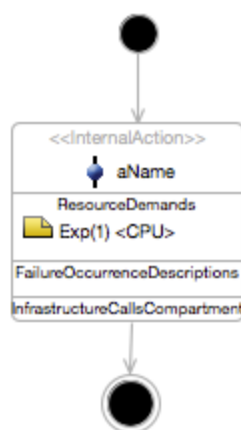
```
--> Reading file  MaudeResults/result_4000tu_saturation.txt
--> Reading file  PalladioResults/result_4000tu_saturation.csv
size of the sample
# size:    1000
e-Motions data analysis:
# mean:    3.666705
# st dev:  2.29267899094
PCM data analysis:
# mean:    3.60407902455
# st dev:  2.0836587027
(0.025984984984985027, 0.88455732393889297)
```

And with CDF plot (for the 1000 samples) is:



TestExp

This test is the same as the shown above but with an Exponential expression.

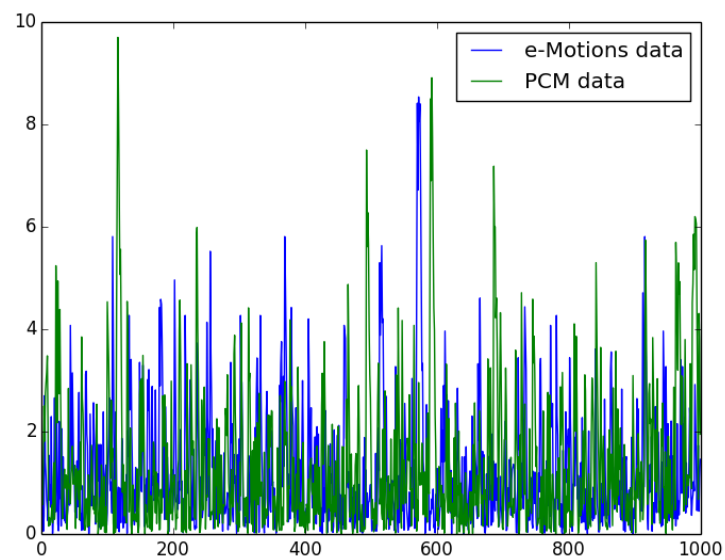
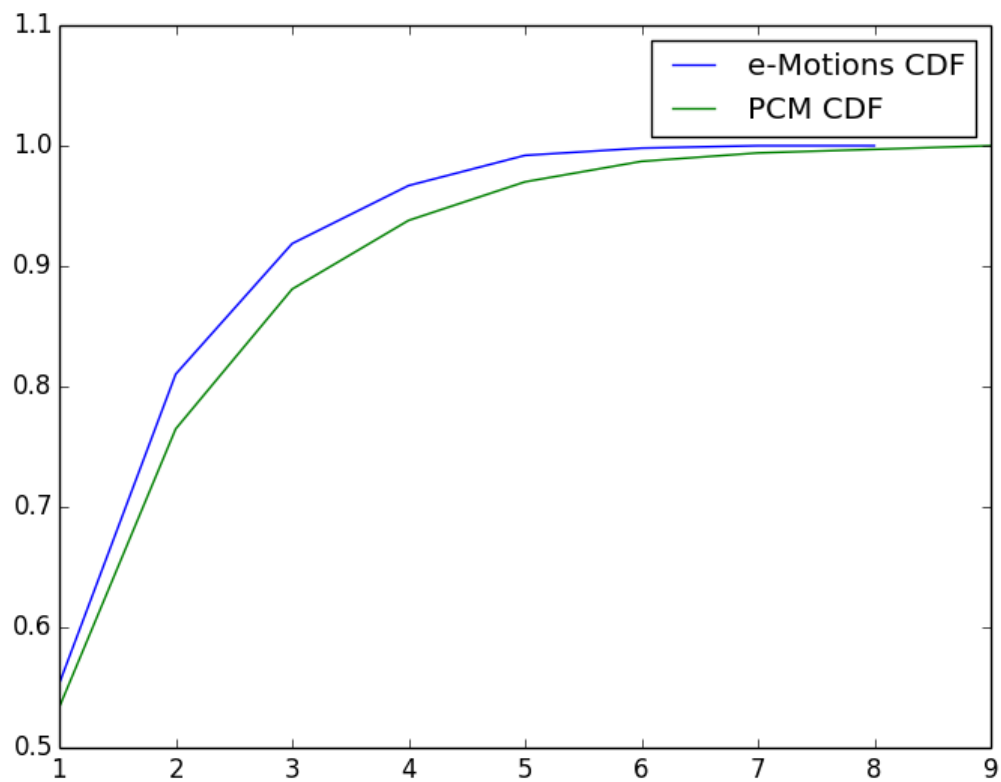


This time the execution has been executed with no queue saturation, achieving the following results:

```
--> Reading file  MaudeResults/result_2000tu.txt
--> Reading file  PalladioResults/result_2000tu.csv
size of the sample
```

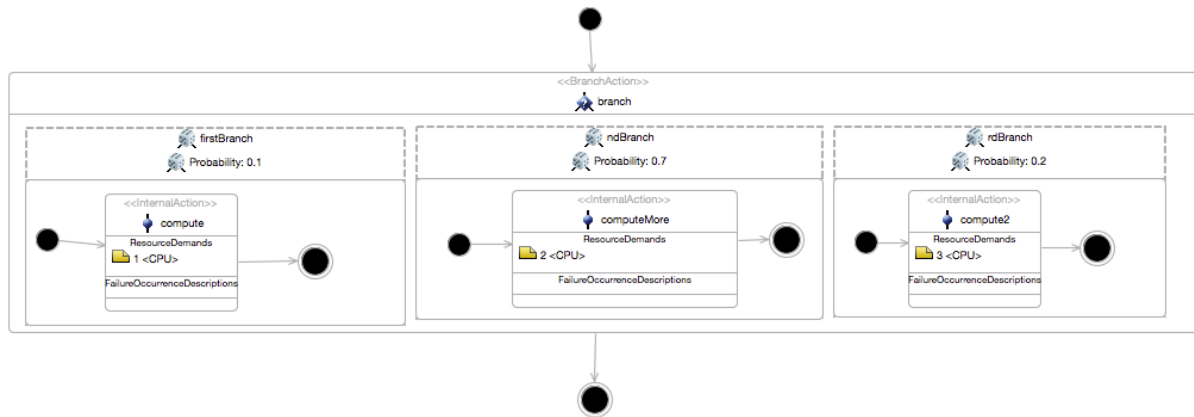
```
# size:      1000
e-Motions data analysis:
# mean:      1.21707140053
# st dev:    1.20374628084
PCM data analysis:
# mean:      1.3804171992
# st dev:    1.43394739583
(0.0610000000000000054, 0.046441739075243287)
```

This is the CDF for the 2000 t.u (1000 samples).



BranchTest

This test is the same, but with branches. This is because I was wondering if the algorithm we did to handle branches was working properly. So the example is shown below:

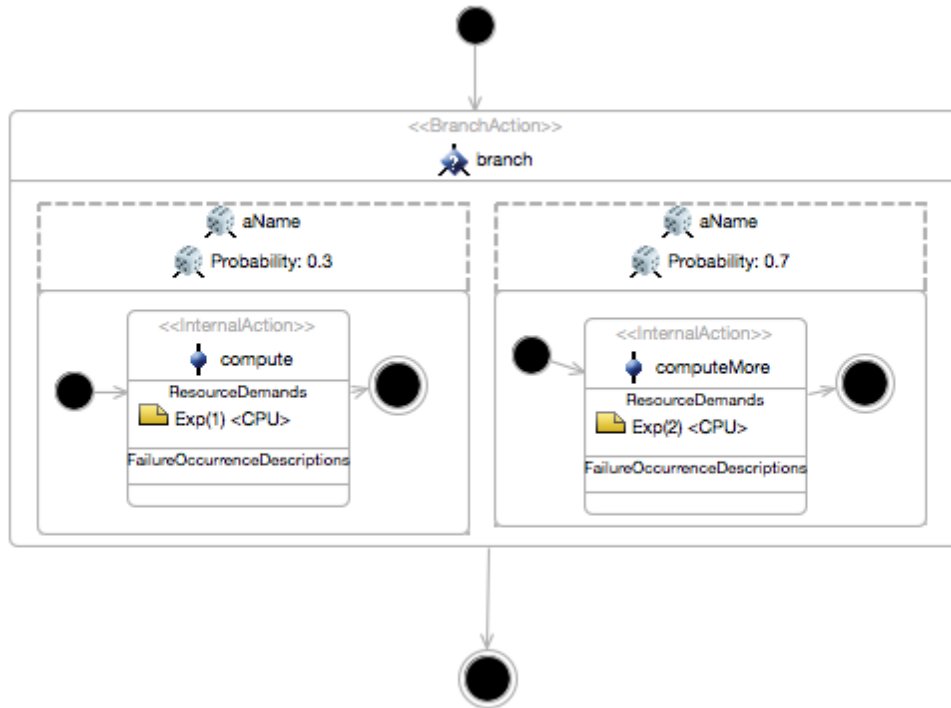


And the results are:

```
--> Reading file MaudeResults/result_5000tu.txt
--> Reading file PalladioResults/result_5000tu.csv
size of the sample
# size: 1000
e-Motions data analysis:
# mean: 2.1
# st dev: 0.547722557505
PCM data analysis:
# mean: 2.103
# st dev: 0.527627709659
(0.011999999999999997, 0.99999959361372215)
```

Minimum Example

The MinimumExample case study has been inspired by the one offered by the Palladio Team in the example workspace.

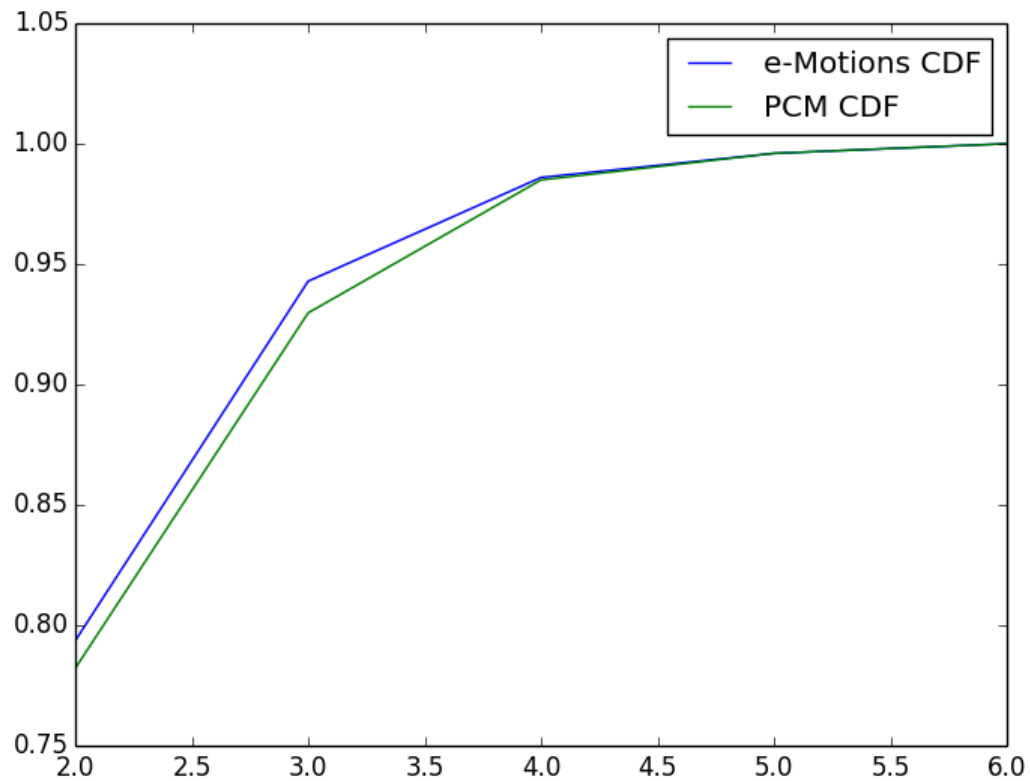


MinimumExample with Exponentials. OpenWorkload with rate : 3.0 t.u.

```

--> Reading file  MaudeResults/result_3000tu_ow_3_exp.txt
--> Reading file  PalladioResults/MinimumExample_Exp_3_3000.csv
size of the sample
# size:    1000
e-Motions data analysis:
# mean:    1.64390740543
# st dev:  0.732271253577
PCM data analysis:
# mean:    1.69071825081
# st dev:  0.769344571462
(0.041542542542542527, 0.34768576280296948)

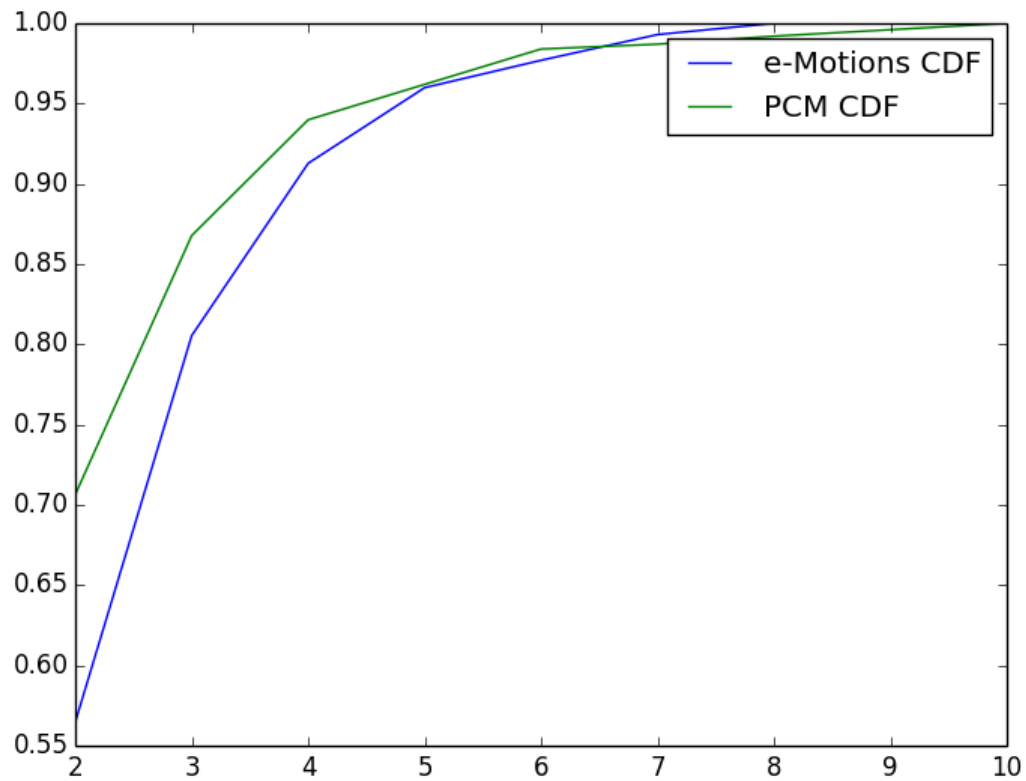
```



MinimumExample with Exponentials. OpenWorkload with rate : 1.0 t.u.

Notes: This example has queues saturation.

```
--> Reading file  MaudeResults/result_1000tu_ow_1.txt
--> Reading file  PalladioResults/MinimumExample_Exp_1_1000.csv
size of the sample
# size:    999
e-Motions data analysis:
# mean:    2.22377951967
# st dev:  1.26503010188
PCM data analysis:
# mean:    1.98198220344
# st dev:  1.26172781012
(0.14514514514514509, 1.1438926119290564e-09)
```

MinimumExample with DoublePDF. OpenWorkload with rate : 2.0 t.u.

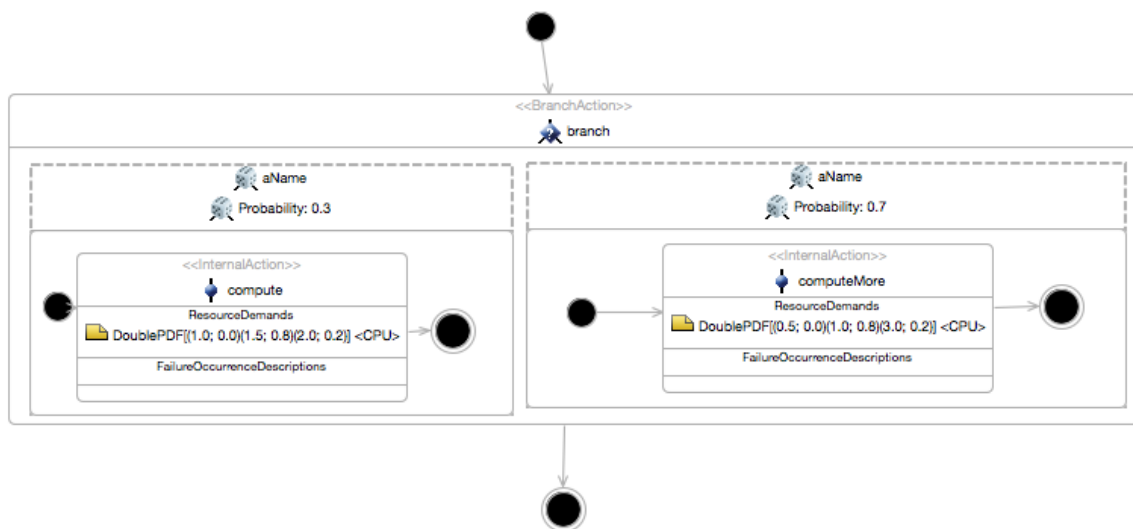


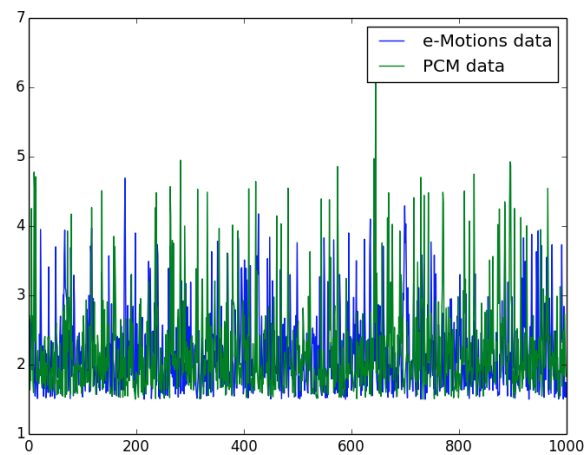
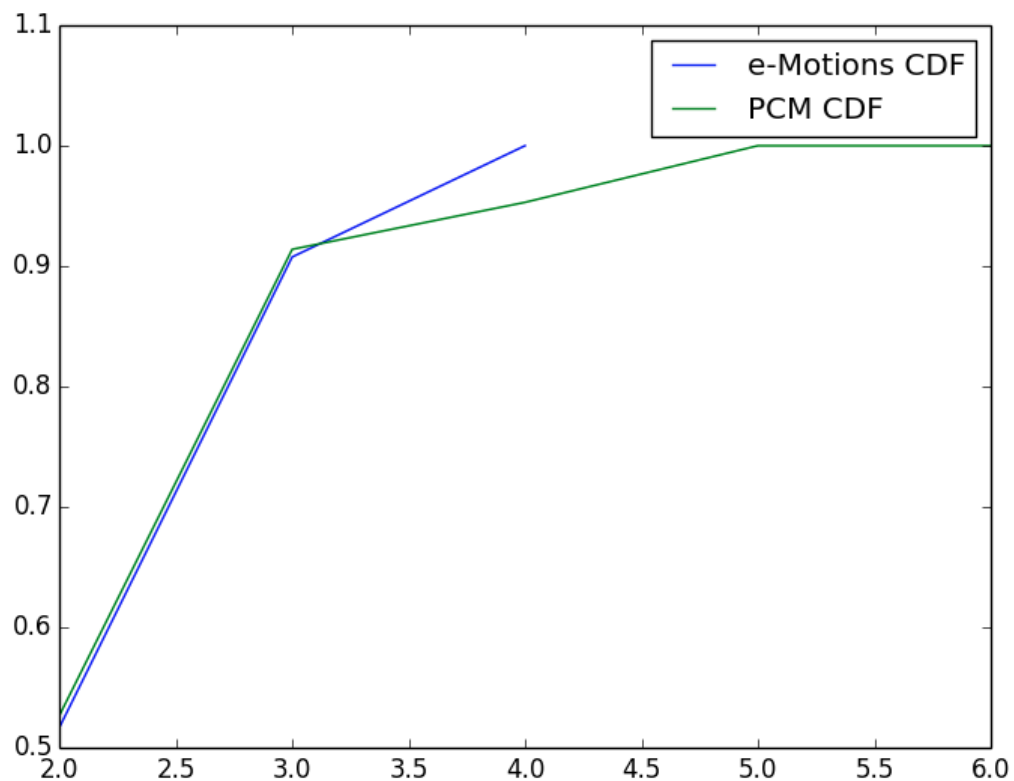
Fig. 4: ComponentA of the MinimumExample with DoublePDF exps.

Execution through 2000 t.u. (1000 samples)

```

--> Reading file  MaudeResults/result_doublepdf_2000tu_ow_2.txt
--> Reading file  PalladioResults/MinimumExample_DoublePDF_2_2000.csv
size of the sample
# size:    1000
e-Motions data analysis:
# mean:    2.17311
# st dev:  0.576859650874
PCM data analysis:
# mean:    2.20668469549
# st dev:  0.689769260191
(0.0470000000000000042, 0.21398843459234124)

```



MinimumExample Extended

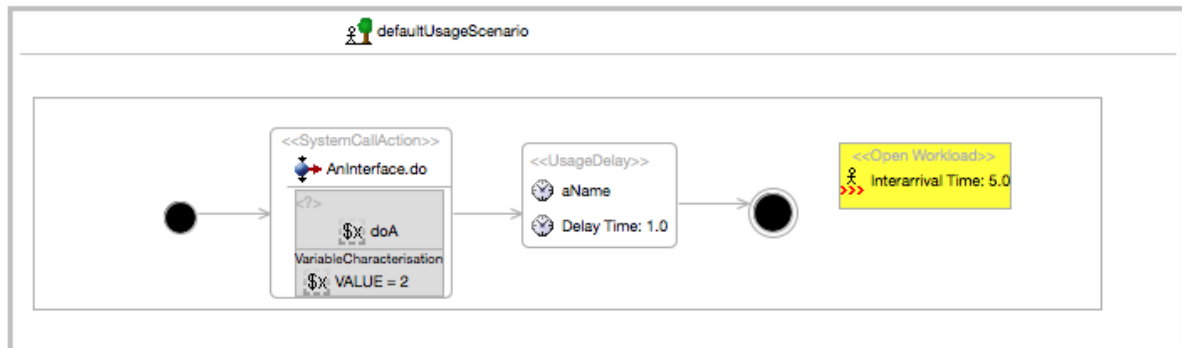
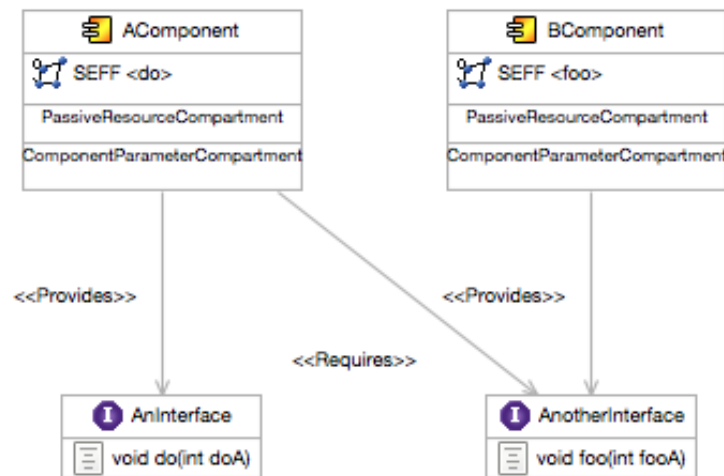
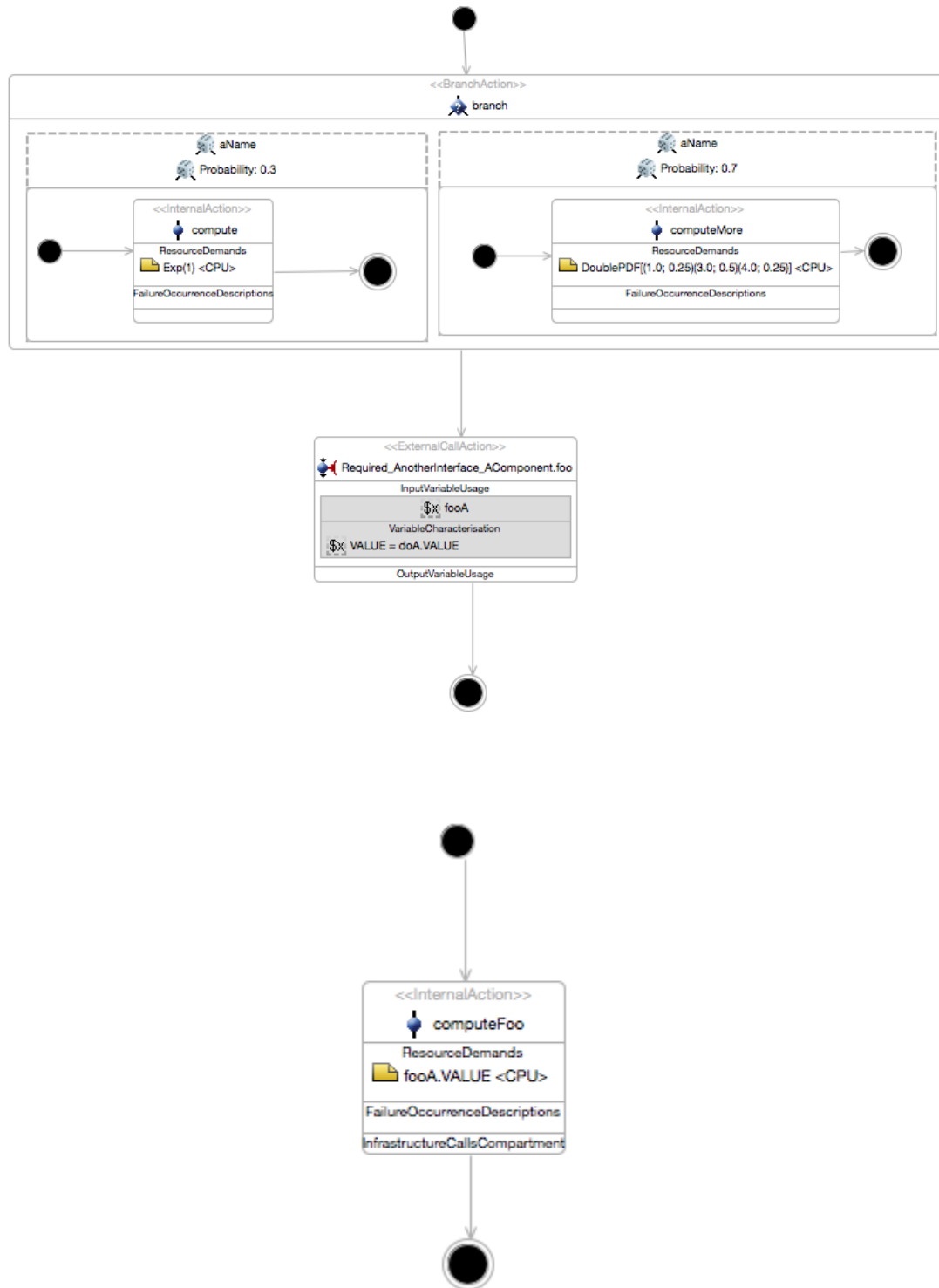


Fig. 6: MinimumExampleExtended Usage Model.



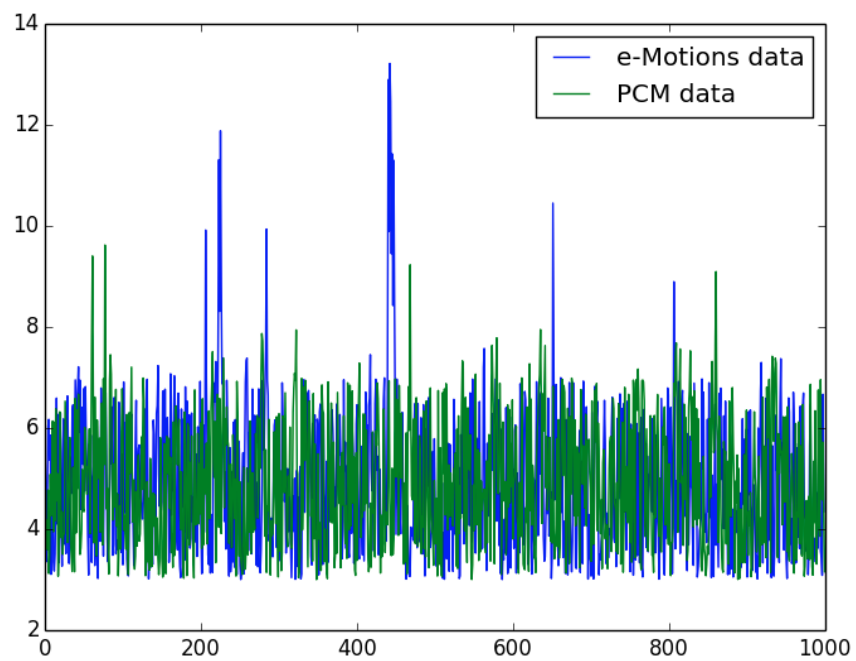
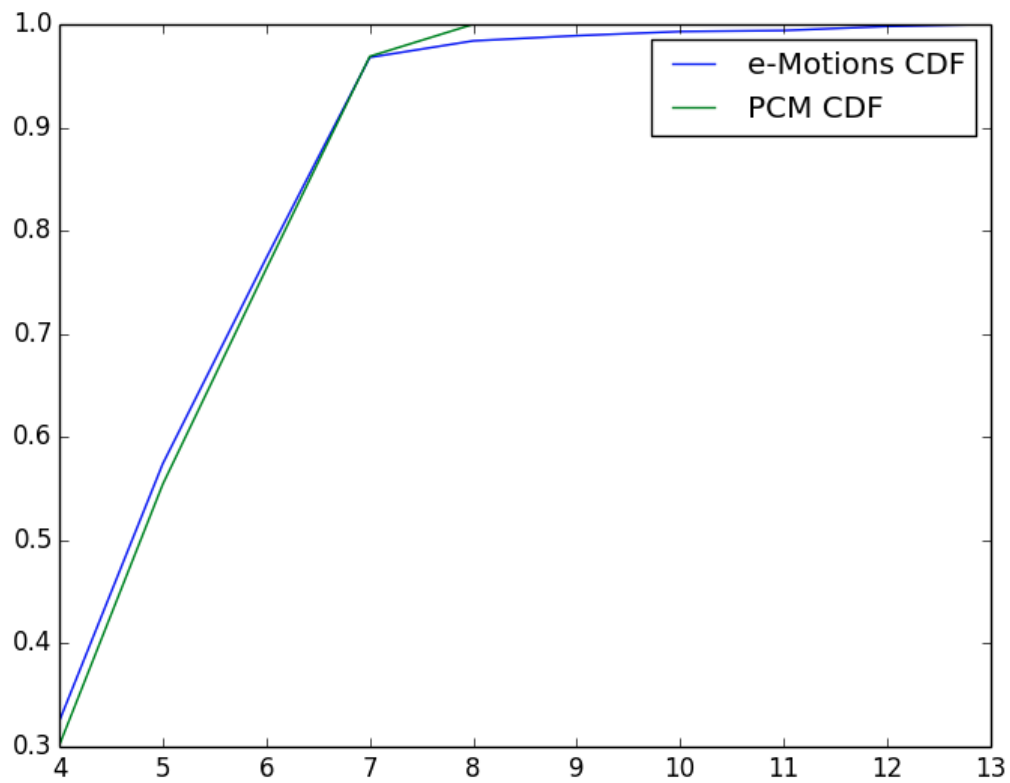


Executed through 5000tu (1000 samples)

```

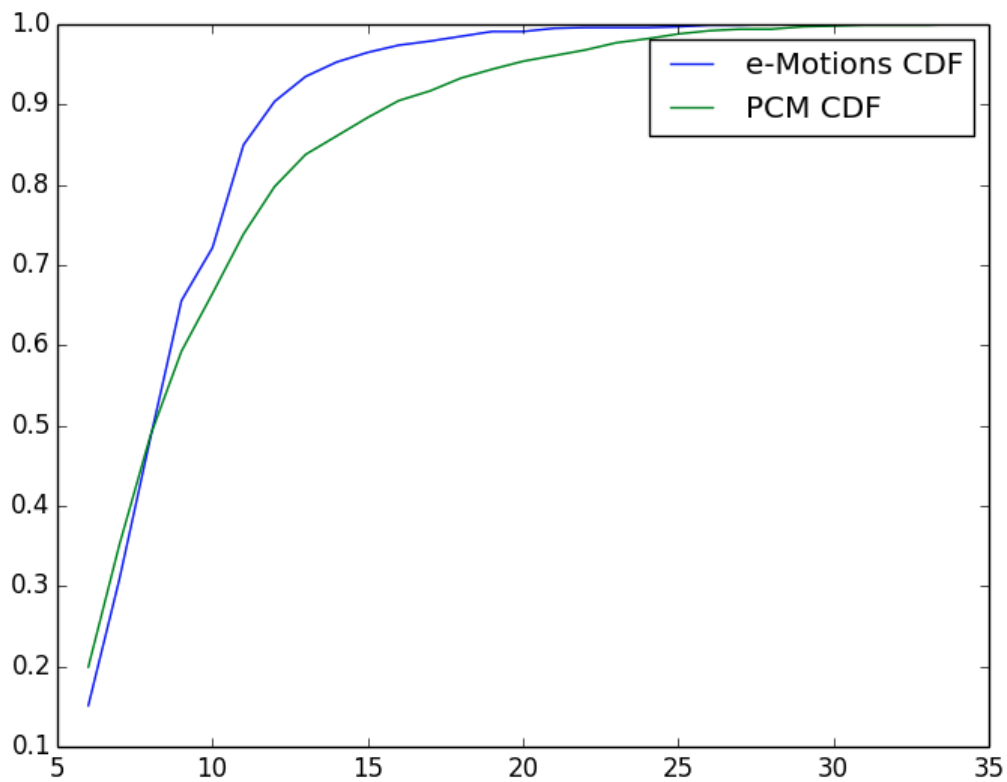
--> Reading file  MaudeResults/result_5000tu.txt
--> Reading file  PalladioResults/result_5000.csv
size of the sample
# size:    999
e-Motions data analysis:
# mean:    4.89821577645
# st dev:  1.41650329644
  
```

PCM data analysis:
mean: 4.91497400937
st dev: 1.26712525896
(0.034284284284284261, 0.59244228149307177)



ECMFA Example

```
--> Reading file  MaudeResults/result_1000samples.txt
--> Reading file  PalladioResults/result_1000samples.csv
size of the sample
# size:    1000
e-Motions data analysis:
# mean:    8.66646863567
# st dev:  2.96795717596
PCM data analysis:
# mean:    9.59398024007
# st dev:  4.63632308877
(0.126, 2.1326445737278948e-07)
```



BranchesUMParameters

```
--> Reading file  MaudeResults/result_1000samples.txt
--> Reading file  PalladioResults/result_1000samples.csv
size of the sample
# size:    1000
e-Motions data analysis:
# mean:    3.926
# st dev:  0.99725824138
PCM data analysis:
# mean:    4.008
# st dev:  0.999967999488
(0.0410000000000000036, 0.36319895384167805)
```

Loops

```
--> Reading file  MaudeResults/result_20000tu.txt
--> Reading file  PalladioResults/result_20000.csv
size of the sample
# size:    998
e-Motions data analysis:
# mean:    19.5365086753
# st dev:  2.34062238516
PCM data analysis:
# mean:    19.3693195137
# st dev:  1.3247944195
(0.0565190380761523, 0.07934948364601338)
```

