```
MyOrtho[m_, pt_, i_] := Module[{oldM, l, trM, trsM, tr2M, otM, outM, vs},
  (* m is the old projection matrix,
  pt is the 2-dimensional new position of vector i *)
  oldM = Transpose[m];
  l = Length[m];
  vs = Join[pt, {Sqrt[1 - Norm[pt]^2]}, ConstantArray[0, l - 3]];
  trM = Join[oldM, RandomReal[{-1, 1}, {l - 2, l}]];
  (* if the matrix is singular try to fix it *)
  While[Det[trM == 0],
   trM = Join[oldM, RandomReal[{-1, 1}, {l - 2, l}]]];
  trsM = trM;
  trsM[[All, i]] = trM[[All, 1]];
  trsM[[All, 1]] = vs;
  otM = Transpose[Orthogonalize[Transpose[trsM]]];
  tr2M = otM;
  tr2M[[All, i]] = otM[[All, 1]];
  tr2M[[All, 1]] = otM[[All, i]];
  outM = Transpose[tr2M[[{1, 2}, All]]];
  Return[outM]
 ]
```

In[2]:=
```
mm = {{0.318, -0.683}, {-0.452, 0.205}, {0.190, -0.291}, {-0.455, 0.335}}
```

Out[2]=
$$\begin{pmatrix} 0.318 & -0.683 \\ -0.452 & 0.205 \\ 0.19 & -0.291 \\ -0.455 & 0.335 \end{pmatrix}$$

In[25]:=
```
MyOrtho[mm, {0.3, 0.4}, 3]
```

Out[25]=
$$\begin{pmatrix} -0.668769 & 0.183564 \\ -0.640092 & 0.30015 \\ 0.3 & 0.4 \\ 0.230281 & 0.846294 \end{pmatrix}$$