## **Supplementary information**

Class	POF length <i>L</i> (m)	Target image	0.1 m	0.5 m	1 m	5 m	10 m
0	Scrambled images						
	Reconstructed images	*	2	3	3	3	6
1	Scrambled images						
	Reconstructed images	1	5	1	13		
2	Scrambled images						
	Reconstructed images	٤	E	1	2	E	
3	Scrambled Images						
J	Reconstructed images	2	2	2	2		
4	Scrambled images						
7	Reconstructed images	4	7	7	3		
5	Scrambled images						
J	Reconstructed images						
6	Scrambled images						
J	Reconstructed images	(1)	(1)	1	\$		
7	Scrambled images						
,	Reconstructed images	4	4	<b>P</b>	4	4	
8	Scrambled images						
0	Reconstructed images	**	B	4	1		
9	Scrambled images						
	Reconstructed images	1	1	(Z)	*	(Y)	

Supplementary figure 1 Example results for all class for various POF lengths (grayscale image)

Class	POF length <i>L</i> (m)	Target image	0.1 m	0.5 m	1 m	5 m	10 m
0	Scrambled images						
	Reconstructed images	\$	か	*	5	\$	
1	Scrambled images						
	Reconstructed images	180	4	ź			
2	Scrambled images						
	Reconstructed images	٤	٤	(1)	٤	E	
3	Scrambled Images						
	Reconstructed images	7	9	>	2		
4	Scrambled images						
	Reconstructed images	4	3	7	3		
5	Scrambled images						
	Reconstructed images	>					
6	Scrambled images						
	Reconstructed images	*	*	1	1		
7	Scrambled images						
	Reconstructed images	4	*	#	*		
8	Scrambled images						
	Reconstructed images	**	(4)	3	F	E	
9	Scrambled images						
	Reconstructed images	8	*	é	*	F	

Supplementary figure 2 Example results for all class for various POF lengths (color image)