

Task 1:

$$P = a_1 P_1 + a_2 P_2 + \dots + a_n P_n$$

$$= a_1 P_1 + (a_2 + a_1 - a_1) P_2 + \dots$$

$$= a_1 P_1 + a_2 P_2 + a_1 P_2 - a_1 P_2 + \dots$$

$$= a_1 (P_1 - P_2) + (a_2 + a_1) P_2 + \dots$$

if $a_1 + a_2 = 1 \Rightarrow = a_1 (P_1 - P_2) + P_2 + \dots$

$$= \text{scalar} \cdot \text{vector} + \text{Point} + \dots = \text{Point} + \dots$$

Task 2:

$$\begin{pmatrix} \cos \alpha & -\sin \alpha & 0 & 0 \\ \sin \alpha & \cos \alpha & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \cos \beta & -\sin \beta & 0 & 0 \\ \sin \beta & \cos \beta & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} =$$

$$\begin{pmatrix} \cos \alpha \cos \beta - \sin \alpha \sin \beta & -\cos \alpha \sin \beta - \sin \alpha \cos \beta & 0 & 0 \\ \sin \alpha \cos \beta + \cos \alpha \sin \beta & -\sin \alpha \sin \beta + \cos \alpha \cos \beta & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} =$$

$$\begin{pmatrix} \cos(\alpha + \beta) & -\sin(\alpha + \beta) & 0 & 0 \\ \sin(\alpha + \beta) & \cos(\alpha + \beta) & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

Task 3: Motion blur in film is caused by the camera iris not closing fast enough.

It does not appear in video games, since they show a series of pictures frame by frame.

I think it can be recreated in WebGL by reusing the depth & color buffers, instead of clearing them before drawing.