## Epipolar line

- $\mathrm{C}_{1}, \mathrm{C}_{2}, \mathrm{P}_{1}$ define a plane
- $\mathrm{P}_{2}$ will be on that plane
- $\mathrm{P}_{2}$ is also on the image plane ${ }_{2}$
- So $\mathrm{P}_{2}$ will be on the line defined by the two planes' intersection



## Search for correspondences on epipolar line

- Reduces the dimensionality of the search space
- Walk on epipolar segment rather than search in entire image



## Parallel views

- Preferred stereo configuration
- epipolar lines are horizontal, easy to search



## Parallel views

- Limit search to epipolar segment
- from $\mathrm{u}_{2}=\mathrm{u}_{1}$ (P is infinitely far away) to 0 (P is close)



## Depth precision analysis

- $1 / \mathrm{z}$ linear with disparity $\left(\mathrm{u}_{1}-\mathrm{u}_{2}\right)$
- better depth resolution for nearby objects
- important to determine correspondences with subpixel accuracy


