A Unifying Theory for Central Panoramic Systems and Practical Implications

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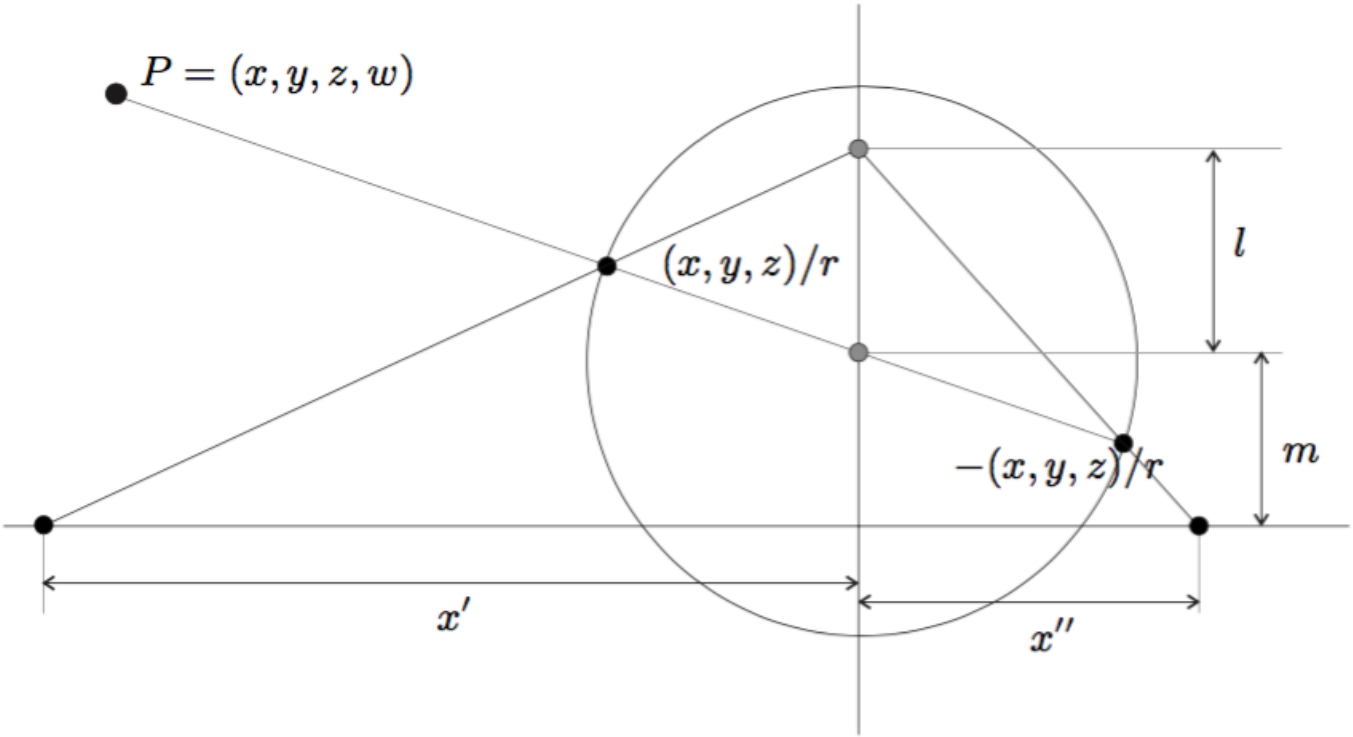

- Provides a unifying theory for all central catadioptric systems, that means for all catadioptric systems with a unique effective viewpoint
- Shows that all of them are isomorphic to projective mappings from the sphere to a plane with a projection center on the perpendicular to the plane
- This unification is novel & has significant impact on the 3D interpretation of images
- Presents new invariances inherent in parabolic projections and a unifying calibration scheme from one view
- Describes the advantages of catadioptric systems & explain why images arising in central catadioptric systems contain more information than images from conventional cameras
- One example is that intrinsic calibration from a single view is possible for parabolic catadioptric systems given only three lines