Brigham Young University

AUVSI Capstone Team (Team 45)

Vision Subsystem Concept Selection Matrices

ID	Rev.	Date	Description	Author	Checked By
CS-002	1.0	10-24-2018	Initial release	Tyler Miller	Derek Knowles
CS-002	1.1	11-07-2018	Added table descriptions	Andrew Torgesen	Derek Knowles
CS-002	1.2	11-09-2018	Added intro & conclusion	Brandon McBride	Tyler Miller

1 Introduction

The concept selection matrices are used to aid us in our decision about which camera we should use in our imaging system. We compared 4 different cameras and weighed them against 7 requirements. Shown below are the matrices; one shows the rating we gave, and the other shows the corresponding values where the ratings come from.

2 Camera Concept Selection

Table 1: Concept Selection Matrix for the camera.

Requirement	**Weight**	**Basler Ace**	**Basler Ace Increased Focal**	**PtGrey Chameleon 3**	**Sony a6000**
Resolution	**3**	2	2	1	5
Weight	**1**	3	3	5	2
Ease of System Integration	**3**	5	5	5	3
Clarity @ 150ft	**5**	1	4	4	5
Stability @ 150ft	**5**	1	1	2	5
Cost	**2**	5	1	4	3
Capture Rate	**2**	3	3	5	2
TOTAL		**50**	**57**	**71**	**86**

3 Measured Camera Values

Table 2: Comparison of relevant camera parameters for different camera candidates.

	Basler Ace	**Basler Ace Increased Focal**	**PtGrey Chameleon 3**	**Sony a6000**
Description	Baseline. The camera from last year with a 12.5mm focal length lens	Last years Basler with a 35mm focal length lens. This decreases field of view, but increases pixels/inch.	Camera from two years ago. Powerful lens, but low Resolution	Camera most commonly used by other AUVSI teams. Low cost, and high resolution
Resolution	5MP	5MP	1.3MP	24MP
Weight	217g	250g	55g	410g
Ease of System Integration	Integrated	Integrated	Previously Integrated	Feasible
Clarity	Blurry, readable	Likely blurry, readable	Readable	Readable
Stability	Target unreadable	Target likely unreadable	Target unreadable	Target readable
Cost	$0	$600	$310	$550
Capture Rate	5Hz	5Hz	30Hz	1Hz

4 Conclusion

The results of the concept selection matrix show that we should use the Sony a6000 for our imaging system. It takes pictures with the highest resolution and takes clear pictures while it is unstable. We will need to put extra effort into integrating it into our system, but it will be well worth it.