

- (72) Inventor: **Stephen Joseph Stemple**, New Albany, IN (US)
- (8) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 74 days.

(21) Appl. No.: 16/460,873

(22) Filed: Jul 2, 2019

(65) **Prior Publication Data**

US 2019/0321706 A1 Oct. 24, 2019

Related U.S. Application Data

- (63) Continuation of application No. 15/674,505, filed on Aug. 10, 2017, now Pat. No. 10,369,445.
- (60) Provisional application No. 62/373,334, filed on Aug. 10, 2016.

(51) **Int. Cl.**

- A63B 69/00* (2006.01)
A63B 24/00 (2006.01)
A63B 71/06 (2006.01)
G06T 7/11 (2017.01)
G06T 7/20 (2017.01)
G06T 7/20 (2017.01)

(52) **U.S. Cl.**

- CPC *A63B 69/0002* (2013.01); *A63B 24/0006* (2013.01); *A63B 24/0021* (2013.01); *A63B 71/0622* (2013.01); *G06T 7/11* (2017.01); *G06T 7/29* (2013.01); *G06T 7/79* (2017.01); *A63B 2024/0012* (2013.01); *A63B 2024/0056* (2013.01); *A63B*

(58) **Field of Classification Search**

CPC A63B 2024/0012; A63B 2024/0034; A63B 2024/0056; A63B 2069/0006; A63B 2220/806; A63B 24/0006; A63B 24/0021; A63B 69/0002; A63B 71/0622; G06T 2207/30224; G06T 2207/30241; G06T 7/11; G06T 7/20; G06T 7/70

See application file for complete search history.

(56)

References Cited

U.S. PATENT DOCUMENTS

- 4,545,576 A 9/1985 Hauke
 7,341,530 B2 3/2008 Chaudhuri et al.
 7,946,960 B2 5/2011 Vito
 8,147,767 B2 * 5/2012 Adams A63B 24/0071
 463-2
 8,333,670 B2 * 12/2012 Oso A63B 69/0002
 473-122
 8,579,734 B2 * 11/2013 Stemple .. . A63B 69/0002
 473-456

(Continued)

FOREIGN PATENT DOCUMENTS

WO WO201054781 10/2001

Primary Examiner — Seng H. Lim

(57) **ABSTRACT**

The present application is directed to a system and method providing vision algorithms for identifying objects traveling in space and identifying the configuration of one or more targets of the objects. The system is suitably programmed to record data related to movement of objects in relation to one or more targets.

20 Claims, 20 Drawing Sheets

