

Design of Linear Series Elastic Actuators for a Humanoid Robot

Coleman Scott Knabe

Thesis submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

Master of Science
in
Mechanical Engineering

Dennis Hong, Co-chair
Brian Lattimer, Co-chair
Craig Woolsey

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Blacksburg, Virginia

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Straight Line Mechanism, Parallel Actuation, Humanoid Robot, Mechanical Advantage
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Coleman Knabe <csknabe@gmail.com>

Permission for use of image

3 messages

Coleman Knabe <csknabe@gmail.com>

Mon, Dec 15, 2014 at 8:55 PM

To: info@maxonmotorusa.com

Hello,

My name is Coleman Knabe, and I am a Master's student from Virginia Tech's TREC lab (previously RoMeLa). I am finalizing my thesis regarding the design of the custom linear actuators for our full size humanoid robot, THOR. These actuators, as well as the actuators on our previous robot SAFFiR, feature Maxon 100W EC-4-pole motors. One of the best photographs taken of SAFFiR was by Maxon for the website, and I would like to use this image of SAFFiR in my thesis.

Could you grant me formal permission to use the attached image of the SAFFiR in my thesis document? If so, you can just respond with an email stating that I "may use the image with permission".

Thank you,
Coleman Knabe
757-532-2995



SAFFiR.png
539K

Setters Debora <DSetters@maxonmotorusa.com>

Tue, Dec 16, 2014 at 8:36 AM

To: Coleman Knabe <csknabe@gmail.com>

Hi Coleman –

Thanks for your email and inquiry. I am checking on this and will get back to you within the week.

Best,

Deb

Deb Setters

National Marketing Manager

maxon precision motors

101 Waldron Road

Fall River, MA 02720-4723

508-677-0520 x 113

Website: www.maxonmotorusa.com

maxon motor | driven by precision

From: Coleman Knabe [mailto:csknabe@gmail.com]

Sent: Monday, December 15, 2014 8:55 PM

To: MPM-Info

Subject: Permission for use of image

[Quoted text hidden]

Setters Debora <DSetters@maxonmotorusa.com>
To: Coleman Knabe <csknabe@gmail.com>

Wed, Dec 17, 2014 at 2:41 PM

Hello Coleman –

Maxon grants you permission to use the SAFFiR image in your thesis as noted below.

Thanks for checking on this and we wish you well with finalizing this very important project.

Regards,

Deb

Deb Setters

National Marketing Manager

maxon precision motors

101 Waldron Road

Fall River, MA 02720-4723

508-677-0520 x 113

Website: www.maxonmotorusa.com

maxon motor | driven by precision

From: Coleman Knabe [mailto:csknabe@gmail.com]

Sent: Monday, December 15, 2014 8:55 PM

To: MPM-Info

Subject: Permission for use of image

Hello,

[Quoted text hidden]

[Quoted text hidden]

Coleman Knabe

757-532-2995



Coleman Knabe <csknabe@gmail.com>

Permission for use of image

2 messages

Coleman Knabe <csknabe@gmail.com>
To: Bryce Lee <bryce.kt.lee@gmail.com>

Mon, Dec 15, 2014 at 8:46 PM

Bryce,

Could you grant me formal permission to use the attached image of the SAFFiR SEA rendering from "Design and Measurement Analysis of a Low-Friction, Lightweight Linear Series Elastic Actuator" in my thesis document? If so, you can just respond with an email stating that I "may use the image with permission".

Thanks,
Coleman



SAFFiR_SEA.png
332K

Bryce Lee <bryce.kt.lee@gmail.com>
To: Coleman Knabe <csknabe@gmail.com>

Mon, Dec 15, 2014 at 8:54 PM

Coleman,

You may use this image with permission.

Thanks,

Bryce

From: Coleman Knabe [mailto:csknabe@gmail.com]

Sent: Monday, December 15, 2014 8:46 PM

To: Bryce Lee

Subject: Permission for use of image

[Quoted text hidden]



Coleman Knabe <csknabe@gmail.com>

Permission for use of image

2 messages

Coleman Knabe <csknabe@gmail.com>
To: Eric Hahn <erichahn525@gmail.com>

Mon, Dec 15, 2014 at 8:47 PM

Eric,

Could you grant me formal permission to use the attached image of THOR posed with the fire hose in my thesis document? If so, you can just respond with an email stating that I "may use the image with permission".

Thanks,
Coleman



THOR_With_Hose.png
319K

Eric Hahn <erichahn525@gmail.com>
To: Coleman Knabe <csknabe@gmail.com>

Mon, Dec 15, 2014 at 8:49 PM

Coleman,
I formally grant you permission to use the attached image of THOR for your thesis document.

Eric Lee Hahn
[Quoted text hidden]