

A State Space Partitioning Scheme for Vehicle Control in Pursuit-Evasion Scenarios

Brian J. Goode

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

Doctor of Philosophy
in
Mechanical Engineering

Michael J. Roan, Chairman
Andrew J. Kurdila
Alexander Leonessa
Cory Papenfuss
Daniel J. Stilwell

October 21, 2011
Blacksburg, Virginia

Keywords: differential games, Bellman optimality, pursuit-evasion, path planning, vehicle control

Copyright 2011, Brian J. Goode

Enclosed in order are the following copyright permissions:

1. American Automatic Control Council letter of permission - for chapter 3.
2. IEEE statement of permission - chapter 4.
3. ASME copyright (see pg. 2) - chapter 5.
4. IASTED letter of permission - chapter 6.
5. SPIE letter of permission - chapter 8.

Author is copyright owner of all remaining chapters.

Brian Goode

From: "Pradeep Misra" <p.x.misra@gmail.com>
To: <bjgoode@vt.edu>
Sent: Wednesday, October 12, 2011 1:18 PM
Subject: Re: [Contact Information] Reprint paper for dissertation
None - only requirements is that you refer to the ACC paper where you are using the content of those papers.

On Wed, Oct 12, 2011 at 1:16 PM, <bjgoode@vt.edu> wrote:

Brian J. Goode sent a message using the contact form at <http://a2c2.org/contact>.

Dear sir,

I am an author of two publications in the ACC conference and I was wondering what steps I need to take to get permission to include them in my dissertation. Thank you!

Brian



RightsLink®

[Home](#)[Account Info](#)[Help](#)

Title: Adaptive fuzzy control of switched objective functions in pursuit-evasion scenarios

Conference Proceedings: Decision and Control (CDC), 2010 49th IEEE Conference on

Author: Goode, B.; Kurdila, A.; Roan, M.

Publisher: IEEE

Date: 15-17 Dec. 2010

Logged in as:
Brian Goode

[LOGOUT](#)

Copyright © 2010, IEEE

Thesis / Dissertaion Reuse

We are happy to grant this permission. Our only requirement is that the requester provides a full credit notice to the original source (author, paper, publication), followed by the IEEE copyright notice.

[BACK](#)[CLOSE WINDOW](#)

Copyright © 2011 [Copyright Clearance Center, Inc.](#) All Rights Reserved. [Privacy statement.](#)
Comments? We would like to hear from you. E-mail us at customercare@copyright.com



COPYRIGHT AGREEMENT (as of March 2010)

ASME Publishing • Three Park Avenue • New York, NY 10016

For questions about Conference paper copyright, please e-mail copyright@asme.org

For questions about Journal paper copyright, please email journalcopyright@asme.org

Before publication of your paper in a conference proceedings or journal, ASME must receive a signed Copyright Agreement. For conference papers, this form should be received by the deadline indicated by the Conference. Other forms may NOT be substituted for this form, nor may any wording on the form be changed.

PAPER NUMBER (for conference/journal papers): DS-10-1338

TITLE: A partitioning Scheme for a Switched Feedback Control Law in
Two-Agent Pursuit-Evasion Scenarios

AUTHOR(s): Brian J. Goode, Andrew Kurdila, Michael Roan

CONFERENCE NAME: -----

JOURNAL NAME: Dynamic Systems, Measurement, & Control

ASME requests that authors/copyright owners assign copyright to ASME in order for a conference or journal paper to be published by ASME. Authors exempt from this request are direct employees of the U.S. Government, whereby papers are not subject to copyright protection in the U.S., or non-U.S. government employees, whose governments hold the copyright to the paper. Otherwise, the author/ copyright owner(s) of the Paper should sign this form as instructed below. Please refer to the section below "Who Should Sign" and also to ASME's [FAQ page](#) for more information regarding copyright ownership and the copyright process.

WHO SHOULD SIGN

Only the copyright owner(s) of the Paper, or an authorized representative, can sign this form. If one of the following applies, you may not own the copyright to the paper, or you may not be authorized to sign this agreement, and you may need to have the appropriate copyright owner(s) or organization representative sign this Agreement:

- (1) You created the Paper within the scope of your employment, and your employer is the copyright owner
- (2) You created the Paper under an independent contractor agreement**
- (3) You received a grant that funded your Paper.

Please review your company policies regarding copyright, and if you are not authorized to sign this agreement, please forward to the appropriate organization representative. Please review applicable company, institutional, and grant policies and your employment/independent contractor agreement to determine who holds the rights to your Paper. For more information, please refer to the [FAQs](#).

****Note to U.S. Government Contractors:** If you created the Paper under contract with the U.S. Government, e.g., U.S. Government labs, the paper may be subject to copyright, and you or your employer may own the copyright. Please review your company/institutional policies and your contractor agreement. Your Paper may also require a footer acknowledging contract information and also the following statement:

"The United States Government retains, and by accepting the article for publication, the publisher acknowledges that the United States Government retains, a non-exclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this work, or allow others to do so, for United States Government purposes."

It is your responsibility to ensure that the final PDF version of the Paper you submit includes all necessary footers and statements required under your contract.

COPYRIGHT ASSIGNMENT

The following terms of copyright assignment refer to Sections 1, 2, and 3. Sections 4 and 5 may not be subject to copyright.

The undersigned hereby assigns irrevocably to ASME all worldwide rights under copyright in the Paper.


Authors retain all proprietary rights in any idea, process, procedure, or articles of manufacture described in the Paper, including the right to seek patent protection for them. Authors may perform, lecture, teach, conduct related research, display all or part of the Paper, and create derivative works in print or electronic format. Authors may reproduce and distribute the Paper for non-commercial purposes only. Non-commercial applies only to the sale of the paper per se. For all copies of the Paper made by Authors, Authors must acknowledge ASME as original publisher and include the names of all author(s), the publication title, and an appropriate copyright notice that identifies ASME as the copyright holder.

PLEASE READ THE TERMS AND CONDITIONS WHICH ARE FULLY INCORPORATED IN THIS AGREEMENT.

1. PAPERS OWNED BY ONE AUTHOR OR JOINT AUTHORS; DESIGNATED AUTHORS (For jointly authored works, all authors should submit a signed Agreement, or one Designated Author may sign on behalf of the other authors, but ONLY IF the designated author has secured written authorization to do so from all other authors. The designated author must be able to produce such written authorization if requested.)

Designated authors, please sign below and list the names of the co-authors for whom you are signing. Please include full contact information for each author. Attach additional sheets if necessary. Author(s)/co-author(s) not covered by the Designated author, please sign in the appropriate section below and provide full contact information.

Author, Co-Author, or Designated Author

Name: Brian J. Goode Signature:  Date: 5/19/2011
Affiliation: Virginia Tech Job Title: Research Assistant
(Company or Institution)
Address: 136 Durham Hall Blacksburg VA 24060 US
(Street Address) (City) (State) (Zip Code) (Country)
Phone: 757-871-5328 Fax: ---- Email: bjgoode@vt.edu

Author

Name: Andrew Kurdila Date: 5/19/2011
Affiliation: Virginia Tech Job Title: Professor
(Company or Institution)
Address: 305 Durham Hall Blacksburg VA 24060 USA
(Street Address) (City) (State) (Zip Code) (Country)
Phone: (540) 231-4162 Fax: ----- Email: kurdila@vt.edu

2. PAPERS OWNED BY EMPLOYER OF AUTHOR(s) (Author may sign if so authorized; otherwise, an officer or other authorized agent of the employer should sign below.)

Name: _____ Signature: _____ Date: _____
Affiliation: _____ Job Title: _____
(Company or Institution)
Address: _____
(Street Address) (City) (State) (Zip Code) (Country)
Phone: _____ Fax: _____ Email: _____

Author

The following terms of copyright assignment refer to Sections 1, 2, and 3. Sections 4 and 5 may not be subject to copyright.

The undersigned hereby assigns irrevocably to ASME all worldwide rights under copyright in the Paper.

Authors retain all proprietary rights in any idea, process, procedure, or articles of manufacture described in the Paper, including the right to seek patent protection for them. Authors may perform, lecture, teach, conduct related research, display all or part of the Paper, and create derivative works in print or electronic format. Authors may reproduce and distribute the Paper for non-commercial purposes only. Non-commercial applies only to the sale of the paper per se. For all copies of the Paper made by Authors, Authors must acknowledge ASME as original publisher and include the names of all author(s), the publication title, and an appropriate copyright notice that identifies ASME as the copyright holder.

PLEASE READ THE TERMS AND CONDITIONS WHICH ARE FULLY INCORPORATED IN THIS AGREEMENT.

1. PAPERS OWNED BY ONE AUTHOR OR JOINT AUTHORS; DESIGNATED AUTHORS (For jointly authored works, all authors should submit a signed Agreement, or one Designated Author may sign on behalf of the other authors, but ONLY IF the designated author has secured written authorization to do so from all other authors. The designated author must be able to produce such written authorization if requested.)

Designated authors, please sign below and list the names of the co-authors for whom you are signing. Please include full contact information for each author. Attach additional sheets if necessary. Author(s)/co-author(s) not covered by the Designated author, please sign in the appropriate section below and provide full contact information.

Author, Co-Author, or Designated Author

Name: Michael Roan Signature: [Signature] Date: 5/17/2011
Affiliation: Virginia Tech Job Title: Professor
(Company or Institution)
Address: 114-G Randolph Blacksburg VA 24060 USA
(Street Address) (City) (State) (Zip Code) (Country)
Phone: (540)231-5846 Fax: _____ Email: mroan@vt.edu

Author

Name: _____ Date: _____
Affiliation: _____ Job Title: _____
(Company or Institution)
Address: _____
(Street Address) (City) (State) (Zip Code) (Country)
Phone: _____ Fax: _____ Email: _____

2. PAPERS OWNED BY EMPLOYER OF AUTHOR(S) (Author may sign if so authorized; otherwise, an officer or other authorized agent of the employer should sign below.)

Name: _____ Signature: _____ Date: _____
Affiliation: _____ Job Title: _____
(Company or Institution)
Address: _____
(Street Address) (City) (State) (Zip Code) (Country)
Phone: _____ Fax: _____ Email: _____

Author

Name: _____ Date: _____

Affiliation: _____ Job Title: _____
(Company or Institution)

Address: _____
(Street Address) (City) (State) (Zip Code) (Country)

Phone: _____ Fax: _____ Email: _____

3. PAPERS CREATED BY U.S. FEDERAL OR STATE GOVERNMENT CONTRACTORS (Please sign below if you created the Paper under contract with the U.S. Federal or State government (e.g., U.S. government labs), and you are authorized to sign on behalf of your organization; otherwise, an officer or other authorized agent should sign. Please include any required footers on the final PDF version of your Paper.)

Name: _____ Signature: _____ Date: _____

Affiliation: _____ Job Title: _____
(Company or Institution)

Address: _____
(Street Address) (City) (State) (Zip Code) (Country)

Phone: _____ Fax: _____ Email: _____

Author

Name: _____ Date: _____

Affiliation: _____ Job Title: _____
(Company or Institution)

Address: _____
(Street Address) (City) (State) (Zip Code) (Country)

Phone: _____ Fax: _____ Email: _____

PAPERS NOT SUBJECT TO COPYRIGHT ASSIGNMENT

4. PAPERS CREATED BY U.S. FEDERAL GOVERNMENT EMPLOYEES

Please sign below if you created the Paper within your scope of your employment by the U.S. Federal Government, and you are authorized to sign on behalf of your agency or department; otherwise, an officer or authorized agent should sign. Please include the following footer on the final PDF version of the Paper you submit: "This material is declared a work of the U.S. Government and is not subject to copyright protection in the United States. Approved for public release; distribution is unlimited."

Name: _____ Signature: _____ Date: _____

Affiliation: _____ Job Title: _____
(Company or Institution)

Address: _____
(Street Address) (City) (State) (Zip Code) (Country)

Phone: _____ Fax: _____ Email: _____

Author

Name: _____ Date: _____

Affiliation: _____ Job Title: _____
(Company or Institution)

Address: _____

(Street Address)

(City)

(State)

(Zip Code)

(Country)

Phone: _____ Fax: _____ Email: _____

5. PAPERS CREATED BY NON-U.S. GOVERNMENT EMPLOYEES

Please fill in and sign below if you created the Paper within the scope of your duties as an officer or employee of a non-U.S. government, and you are authorized to sign on behalf of your government; otherwise, an officer or authorized agent should sign.

This work was prepared while under employment by the Government of _____
as part of the official duties of the author indicated below, and as such copyright is owned by that Government, which reserves its own
copyright under national law. The copyright notice on the paper should read: _____

Name: _____ Signature: _____ Date: _____

Affiliation: _____ Job Title: _____
(Company or Institution)

Address: _____
(Street Address) (City) (State) (Zip Code) (Country)

Phone: _____ Fax: _____ Email: _____

Author

Name: _____ Date: _____

Affiliation: _____ Job Title: _____
(Company or Institution)

Address: _____
(Street Address) (City) (State) (Zip Code) (Country)

Phone: _____ Fax: _____ Email: _____

August 31, 2009

ASME COPYRIGHT FORM TERMS AND CONDITIONS

The following terms and conditions are fully incorporated into the Copyright Form. Please read them carefully.

REPRESENTATIONS, OBLIGATIONS, ACKNOWLEDGEMENTS, AND INDEMNIFICATION

You represent and acknowledge that:

(A) This Paper represents: either the first publication of material or the first publication of an original compilation of information from a number of sources as specifically noted by footnotes and/or bibliography.

(B) You have the right to enter into this Copyright Form and to make the assignment of rights to ASME. If the Paper contains excerpts from other copyrighted material (including without limitation any diagrams, photographs, figures or text), you have acquired in writing all necessary rights from third parties to include those materials in the Paper, and have provided appropriate credit for that third-party material in footnotes or in a bibliography.

(C) If you are signing this Form on behalf of any co-authors or other copyright holders, you have obtained express authorizations from all those authors and/or copyright holders to make this assignment of rights to ASME.

(D) To the best of the author's knowledge, all statements contained in the Paper purporting to be facts are true or supported by reasonable scientific research, the Paper does not contain any defamatory or libelous material and does not infringe any third party's copyright, patent, trade secret, or other proprietary rights and does not violate the right of privacy or publicity of any third party or otherwise violate any other applicable law; furthermore that to the best of your ability, you are responsible for ensuring the accuracy of your research and the Paper's content.

(E) If the Paper was produced in the course of an author's employment by, or contractual relationship with, the U.S. Federal or State Government and/or contains classified material, it has been appropriately cleared for public release and such is indicated in the paper.

(F) The Paper is not subject to any prior claim, encumbrance or form and is not under consideration for publication elsewhere.

(G) You have appropriately cited and acknowledged all third parties who have contributed significantly in the Paper's technical aspects.

(H) ASME is not responsible for any misrepresentation, errors or omissions by those signing this copyright form.

(I) All print and electronic copies of the Paper submitted to ASME become ASME's physical property regardless of whether or not ASME publishes the Paper, and that ASME is not obligated to publish your paper (see the Termination Section below if your paper is not published).

(J) ASME is not responsible for any of your expenses incurred in connection with preparing the Paper or attending meetings to present it, nor will ASME pay you any financial compensation if it publishes your Paper.

(K) Subject to and to the maximum extent permitted by law, you agree to indemnify and hold harmless ASME from any damage or expense related to a breach of any of the representations and warranties above.

TERMINATION

If ASME decides not to publish your Paper, this Form, including all of ASME's rights in your Paper, terminates and you are thereafter free to offer the Paper for publication elsewhere.

GENERAL PROVISIONS

This Copyright Form, the Terms & Conditions, and ASME Copyright Guidelines, constitutes the entire agreement between you and ASME, and supersedes all prior or current negotiations, understandings and representations, whether oral or written, between you and ASME concerning the Paper.

This Agreement is governed by, and should be construed in accordance with, the laws of the State of New York, United States of America, applicable to agreements made and performed there, except to the extent that your institution is prohibited by law from entering contracts governed by New York law, in which limited case this Agreement is governed by, and should be construed in accordance with, the laws of the jurisdiction in which your institution is located. Any claim, dispute, action or proceeding relating to this Agreement may be brought only in the applicable state and federal courts in the State and County of New York, and you expressly consent to personal jurisdiction and venue in any of those courts.

Brian J. Goode

From: IASTED Calgary [Calgary@iasted.org]
Sent: Monday, July 25, 2011 3:37 PM
To: 'bjgoode@vt.edu'
Subject: RE: IASTED Paper 729-042

Dear Brian,

Thank you for your email. You can include the relevant parts in your dissertation as long as you reference where the sections were originally published.

If you have any more questions, please do not hesitate to contact me.

Yours sincerely,

Nadia Leamy

-----Original Message-----

From: bjgoode@vt.edu [<mailto:bjgoode@vt.edu>]
Sent: Saturday, July 23, 2011 6:47 PM
To: IASTED Calgary
Subject: IASTED Paper 729-042

Good evening,

My name is Brian Goode and I am the primary author for paper 729-042. This was submitted to the Control and Applications Conference, 2011. I would like permission to include parts of this paper in my dissertation. What do I need to do to make this possible? Thank you for your time.

Brian

Brian J. Goode

From: Scott McNeill [scottm@spie.org]
Sent: Monday, October 03, 2011 11:39 AM
To: Brian J. Goode
Subject: RE: Reprint for Dissertation

Dear Brian Goode,

Thank you for seeking permission from SPIE to reprint material from our publications. As an author of the cited work, you retain co-owner rights to the original content therein. Publisher's permission is hereby granted under the following conditions: (1) the material to be used has appeared in our publication without credit or acknowledgment to another source; and (2) you credit the original SPIE publication. Include the authors' names, title of paper, volume title, SPIE volume number, and year of publication in your credit statement.

Sincerely,

Scott McNeill for
Eric Pepper, Director of Publications
SPIE
P.O. Box 10, Bellingham WA 98227-0010 USA
360/676-3290 (Pacific Time) eric@spie.org

From: Brian J. Goode [<mailto:bjgoode@vt.edu>]
Sent: Friday, September 30, 2011 9:29 PM
To: reprint_permission
Subject: Reprint for Dissertation

Dear sir or madam:

I am defending my dissertation on Oct. 21st and would like permission to use this paper, of which I am an author as a chapter:

Goode, B., Chin, P., Roan, M. "Sensor Reduction Techniques using Bellman Optimal Approximations of Target and Environment Dynamics." SPIE Conference on Defense, Security, and Sensing, 2011, vol. 8050, 805018.

Please advise on what actions I need to take. Thank you very much!

Brian

Brian J. Goode
Ph. D Candidate
Vibrations and Acoustics Lab
136 Durham Hall, Virginia Tech