

# Introducing Canary Haz: discovering article PDFs with one click

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6/6/2017

*Access to PDFs of research papers is too often overly complicated and restricted. Canary Haz, a free browser plugin that helps researchers access the PDFs they need with just one click, has been released in response to this frustration. **Peter Vincent**, one of the co-founders, explains a little more about how Canary Haz works, while also encouraging feedback from the wider research community.*



Frustrated by unnecessary barriers between researchers and journal papers, two colleagues from Imperial College London and I set out on a mission to solve the academic PDF “access problem”. Last month we released [Canary Haz](#), a free browser plugin that helps researchers access the PDFs they need with just one click!

From a given starting point, such as a publisher article page or Google Scholar results, Canary Haz begins its search. Where available it uses your institutional login credentials to hop over paywalls and dig out the final published version of the PDF. If unsuccessful, it will look for open versions, including preprints, and accepted manuscripts hosted on author blogs. The plugin then automatically serves up the best version of the PDF behind a single button click, and for good measure stores it in your own private Canary Haz locker, so you can access it again later. No more frantic Google searching, chasing broken links, or fiddling with proxy servers and VPNs – just one click to the PDF!

## The problem

Academics around the world communicate their discoveries in journal papers, distributed as PDF documents. The corpus of all published journal papers represents a significant fraction of the planet’s knowledge across a wide range of disciplines, from history and the arts, to sciences, engineering and medicine. Unfortunately, access to academic PDFs is overly complicated and often restricted; mired in legacy technology, vested interests, and a complex legal landscape that is in significant flux.

Frustrated by the stance of certain publishers, some academics have chosen to boycott their journals, [refusing to publish in them](#). More significantly, funders such as [RCUK](#), and the [European Commission](#) have introduced open access policies, mandating deposition of “preprints” in open repositories, a practice that in the longer term may prove incompatible with publisher business models. Publishers have responded by revising their policies, [allowing sharing of academic PDFs within research groups](#). However, in recent months [major research institutions](#), and even [whole countries](#), have been unable to agree journal subscription renewals with publishers, and [court cases are now pending](#). Layer into this a series of complex systems for delivering subscribed content (based on a mix of Shibboleth, proxy servers, VPNs, etc.) and legacy inter-library loan systems, seemingly developed in a time before photocopiers existed, let alone email and the internet, and the powder keg is set. Cue the final spark: Sci-Hub, an illegal but nonetheless highly effective way of accessing PDF journal papers on the (dark) web, which [even users with paid-for subscriptions seem to prefer](#), and it becomes clear that the status quo is unsustainable.

## Our solution

Our solution is [Canary Haz](#), a browser plugin that gives researchers access to the best version of the PDF they need with *one click*, whether on or off campus. *One click* for instant, no-fuss access. So academics can get on with their research! It’s really that simple, but also, based on initial feedback, very powerful! Here are some example use

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Computers & Fluids  
Volume 139, 5 November 2016, Pages 130-147

**A fully discrete adjoint method for optimization of flow problems on deforming domains with time-periodicity constraints**

M.J. Zahr<sup>a,\*</sup>, P.-O. Persson<sup>b</sup>, J. Wilkening<sup>b</sup>

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Edited By Chunlei Liang, Krzysztof Fidkowski, Per-Olof Persson, Peter Vincent and Gustaf Jacobs

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**A Fully Discrete Adjoint Method for Optimization of Flow Problems on Deforming Domains with Time-Periodicity Constraints**

M. J. Zahr<sup>a,1,\*</sup>, P.-O. Persson<sup>b,2</sup>, J. Wilkening<sup>b,2</sup>

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DCJ 12 Aug 2016

**Abstract**

A variety of shooting methods for computing fully discrete time-periodic solutions of partial differential equations, including Newton-Krylov and optimization-based methods, are discussed and used to determine the periodic, compressible, viscous flow around a 2D flapping airfoil. The Newton-Krylov method uses matrix-free GMRES to solve the linear systems of equations that arise in the nonlinear iterations, with matrix-vector products computed via the linearized sensitivity evolution equations. The adjoint method is used to compute gradients for the gradient-based optimization shooting methods. The Newton-Krylov method is shown to exhibit superior convergence to the optimal solution for these fluid problems, and fully leverages quality starting data.

The central contribution of this work is the derivation of the adjoint equations and the corresponding adjoint method for fully discrete, time-periodically constrained partial differential equations. These adjoint

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**Highlights**

- Derived adjoint equations for time-periodically constrained fully discrete PDE.
- Introduced shooting method to solve periodic adjoint equations (2pt BVP).
- Introduced adjoint method for computing gradients on manifold of periodic solutions.

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<p><b>ARTICLE INFO</b></p> <p><small>Article history: Received 30 December 2015 Revised 17 May 2016 Accepted 21 May 2016 Available online 24 May 2016</small></p>	<p><b>ABSTRACT</b></p> <p><small>A variety of shooting methods for computing fully discrete time-periodic solutions of partial differential equations, including Newton-Krylov and optimization-based methods, are discussed and used to determine the periodic, compressible, viscous flow around a 2D flapping airfoil. The Newton-Krylov method uses matrix-free GMRES to solve the linear systems of equations that arise in the nonlinear iterations with matrix-vector products computed via the linearized sensitivity evaluation equations. The</small></p>
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## A Fully Discrete Adjoint Method for Optimization of Flow Problems on Deforming Domains with Time-Periodicity Constraints

Matthew J. Zahr, Per-Olof Persson, Jon Wilkening

(Submitted on 2 Dec 2015 (v1), last revised 12 Aug 2016 (this version, v2))

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The central contribution of this work is the derivation of the adjoint equations and the corresponding adjoint method for fully discrete, time-periodically constrained partial differential equations. These adjoint equations constitute a linear, two-point boundary value problem that is provably solvable. The periodic adjoint method is used to compute gradients of quantities of interest along the manifold of time-periodic

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Other tools exist for finding open versions of PDFs, including [Unpaywall](#) and OA Button. However, neither of these also integrates with your library subscriptions to deep link through paywalls; in this regard, Canary Haz is unique. Moreover, Canary Haz features direct integration with Google Scholar and PubMed search results, and a private Canary Haz locker for storing the papers you access.

Canary Haz is still a work in progress; it's currently in alpha testing, and we greatly appreciate any feedback from the research community. Please visit our [website](#), sign up (it takes 30 seconds), install the plugin (another 30 seconds), and let us know what you think! Oh, and in case you were wondering, Canary Haz is a play on the [#icanhazpdf](#) Twitter hashtag!

*Note: This article gives the views of the author, and not the position of the LSE Impact Blog, nor of the London School of Economics. Please review our [comments policy](#) if you have any concerns on posting a comment below.*

### **About the author**

**Peter Vincent** is a Reader and EPSRC Fellow working in the department of Aeronautics at Imperial College London. His research interests include numerical methods, GPU accelerated computational fluid dynamics, and biological fluid dynamics. He is also a founding partner of Quadrature Solutions, a boutique computational and mathematical modelling consultancy, and a co-founder and Director of Canary Haz Limited.

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