SAND2016-7414C

International Digital Image Correlation Society

2016 Conference & Workshop

2016

Philadelphia, PA

Abstract title:	What the ill-posed problem in DIC means for practitioners
Corresponding author (first name):	Dan Turner
Coauthor:	Rich Lehoucq, Phil Reu
University/Company:	Sandia National Laboratories
Street address:	PO Box 5800
Dept/Mail codes:	MS 1323
City:	Albuquerque
State:	New Mexico
Zip/Country postal code:	87185
Country:	USA
Phone:	505 845-7446
Email:	dzturne@sandia.gov
Presentation type (Oral **or** Poster**)**:	Oral

ABSTRACT

Daniel Z. Turner

Sandia National Laboratories

Albuquerque, NM

What the ill-posed problem in DIC means for practitioners

This talk will try to make sense of the mathematical issues involved in DIC at a practical level in terms of what they mean for everyday DIC users or code developers. For context, the study of the ill-posed problem in digital image correlation (DIC) and methods for treating it have begun to emerge in the DIC literature. It is now clear, at least at an abstract level, that because of the ill-posed problem DIC solutions may not be unique and in some cases the displacement field may not be recoverable. The goal of this talk will be to take these abstract ideas and show how they play out in terms of a typical DIC analysis. The focus will be on the impact of particular choices for DIC formulations, for example using a subset-based approach or a regularized global approach, the type of regularization used, and other considerations. How do these choices impact the bottom line and should the typical DIC analyst even think about these issues? This is what we hope to get at.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract No. DE-AC04-94AL85000.

Keywords: Digital Image Correlation (DIC), Ill-posed Problem, Regularization in DIC