Observations on PRAGMA Practices
Reflections on Its History and Future

Peter Arzberger

When You Think of PRAGMA

What are the first word(s) that come to mind?

Welcome to the University of California San Diego

- Scripps Institution of Oceanography – Founded 1905, Part of UC 1912
  - UCSD established 1960
- UCSD Library: Geisel Library – Named in honor of Audrey and Theodor Seuss Geisel
  - Architect: William Pereira (also designed the Transamerica Pyramid in San Francisco)

The Stuart Collection

https://stuartcollection.ucsd.edu/

seeks to enrich the cultural, intellectual, and scholarly life of the UCSD campus and of the San Diego community by building and maintaining a unique collection of site-specific works by leading artists of our time.

Falling Star, by **Do Ho Suh, Open 11 am to 2 pm**

Sun God by Niki de Saint Phalle
She also has art in Fukuoka Japan

The Bear by Tim Hawkinson
Build from local stones (just drive to Poway)

The Snake Path – Alex Smith

Near Campus

Torrey Pines Glider Port

Scripps Coastal Reserve

Torrey Pines State Nature Reserve

La Jolla Trail

PRAGMA Meetings in San Diego

- PRAGMA 1, March 11-12, 2002
- PRAGMA 7, September 15-17, 2004
- PRAGMA 18, March 3- 4, 2010
- PRAGMA 37, September 11-13, 2019

17.5 years
37 workshops
24 Different Hosts
27 Different Locations

PRAGMA 8

When We Started PRAGMA in 2002

What were we thinking?

Remember the question I asked at the beginning?

- An opportunity to leverage investments in networking and interest in Grid
- Avoid compartmentalization community experienced with clusters
- Renewed interest in tackling global issues (in science) through collaboration

So, What Did We Do?

We ran a non-controlled experiment

- Held a series of Workshops (three initially)
- Seeded the speakers with individuals inclined to collaboration
- Gave homework between meetings
- Did not push any specific technology, but tried anything
- Followed through on our commitments
- Established a set of Operating Principles and Procedures (2003) and representative structure of decision making, and “managed, open growth”
- Highlighted successes through the PRAGMA Collaborative Overview
- Looked for new opportunities to make a difference
- Focused on people

We Expanded Membership and Stayed Agile
Mindful of Technology Trends (Grid, Virtualization, Data, Edge, Science)

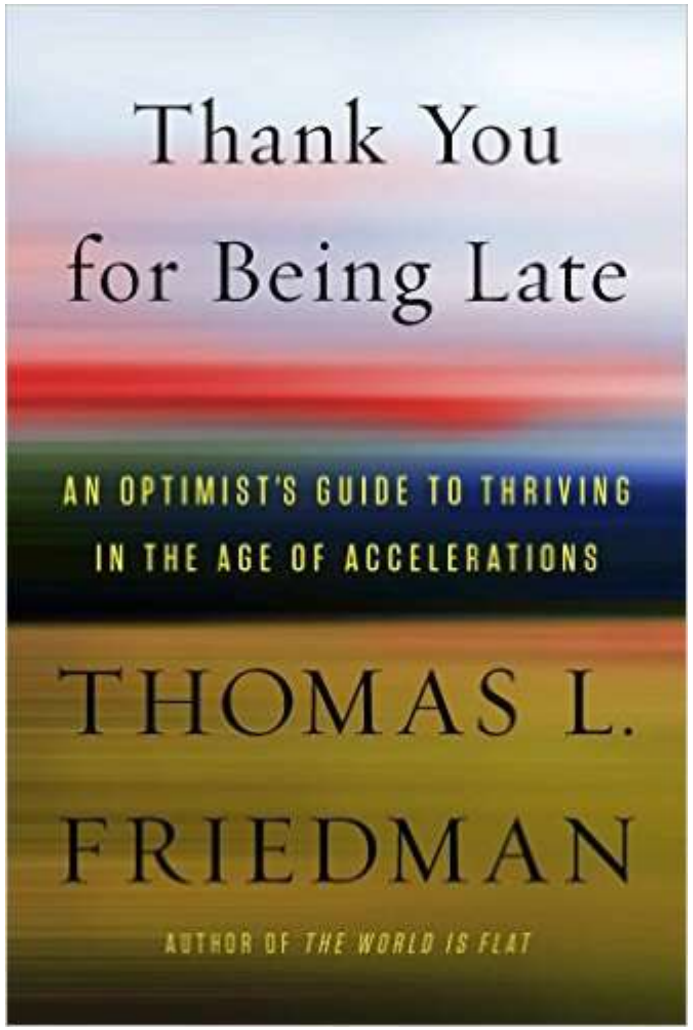
- **2002 – 2005**: Getting Started
  - Established Operating Principles and Procedures (2003)
  - Grew Partnership
  - Launched PRIME (Osaka, NCHC, Monash, + more) and GLEON (built on NCHC activity)
- **2003 (PRAGMA 5 Hsinchu)**: "Make the Grid Usable"
- **2009 (PRAGMA 17 Hanoi)**: Panel shifting focus to virtualization

2007

- **2012**: NSF Renewal
  - Expanded US participation to UF, IU, UW, VT, KU
  - Brought in expertise in SDN, Data, Lakes, Biodiversity
  - Launched two expeditions
- **2013 (PRAGMA 25 Beijing)**
  - Started PRAGMA ENT
- **2016**: First Global CENTRA meeting in Taichung
  - PRAGMA 32 with CENTRA 2 (Gainesville April 2017); PRAGMA 34 with CENTRA 3 (Tokyo May 2018), PRAGMA 36 with CENTRA 4 (JeJu, 2019)
- **2018 (PRAGMA 34 Tokyo)**: First sighting of ABCI
- **2019 (PRAGMA 37 San Diego)**: Panel of future directions

2007: A Technology Inflection Point

- iPhone Announced
- Google launches android
- Amazon release Kindle
- Hadoop started
- Github – development started
- Facebook opened (Sept 2006)
- Twitter spun off as separate platform
- Airbnb conceived
- IBM Watson started
- Intel Introduces non-silicon materials (high-k/metal gates)
- Cost of DNA sequencing begins dramatic decline



And the list goes on

So What Has PRAGMA Accomplished?

- Built a community of practice and trust
- Migrated our experiments into national infrastructure (e.g., Comet)
- Launched new projects
  - Many National Grid Projects
  - GLEON
  - CENTRA
  - PRIME
- Shifted technology approach
- Research Products*: more than 26 software components
- Publications*: 101 (self reported), 43 included students as co-authors
- Changed the conduct of a field of science
- Advanced understanding in several science areas

* Since 2012

When You Think of PRAGMA

What are the first word(s) that come to mind?

When I think of PRAGMA …

- Experiment, experimentation
- Trust
- Colleagues, friends, community
- Commitment, follow through
- Grass roots
- Sharing: resources, expertise, knowledge
- Evolution
- Learning about other cultures
- Core principles, evolving practices
- Tracking trends; adjusting
- Unique contributions
- Impact on science, technology and society
- Open to new ideas
- Students are our legacy
- Fun

Pacific Rim, International

What are your words?

If you want to go fast, go alone
If you want to go far, go together

Find Unique, Shared Challenges
Pursue Them Collaboratively
Change the World

“Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.”

PRAGMA Operating Principles and Procedures (OPP)

- Established February 2003
- Living Document, revised 13 times (last Sept 2018) with Functional Area Roles (4)
  - Modeled in GBIFs charter, used by GLEON to establish their OPP

Goals

- to enable users throughout the Pacific Rim to take advantage of grid technologies for the advancement of e-Science applications.
- to establish sustained collaborations and to advance the use of grid technologies in advanced scientific applications among a community of investigators working with leading institutions throughout the region and around the world.
- community of practice comprising individuals and institutions from around the Pacific Rim that actively collaborate with, and enable, small- to medium-sized groups to solve their problems with information technology.

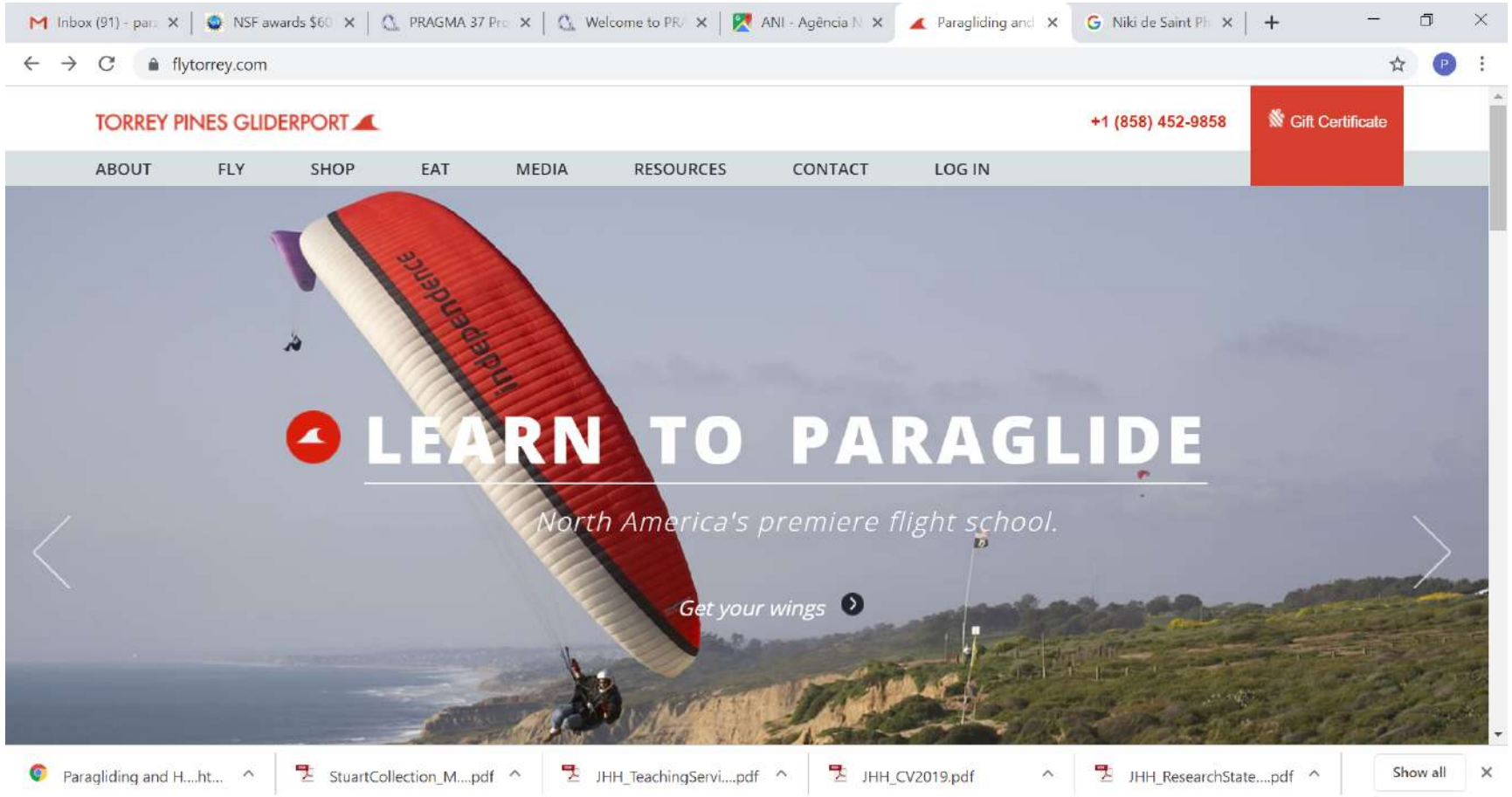
- Some Principles (Understandings)
  - International Forum
  - Open to all institutions (aligned with our goals)
  - Based on goodwill of all members
  - Decisions ideally reached by consensus

- Some Practices (Activities)
  - Encourage and conduct joint projects
  - Share resources
  - Conduct training
  - Exchange researchers
  - Communicate regularly
  - Collaborate with related organizations
  - Disseminate knowledge and proceedings from our meetings
  - Raise resources

- Observations
  - Active engagement of participants
  - Conducting projects or experiments
  - Sharing experiments
  - Testing software

  - Encouraging ideas from all

Some Successes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NSF awards $60
PRAGMA 37 Pro
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