

# **Probability**Management

**2018 Annual Report** 

ProbabilityManagement.org

## A letter from our Executive Director

In *The Failure of Risk Management: Why It's Broken and How to Fix It*, Douglas W. Hubbard argues that most current methodologies "are no better than astrology." This is because risk management must faithfully convey both uncertainty and individual attitudes. Yet many approaches still represent risks as pretty colors on a heat map, or reduce uncertainties to single average cases, resulting in the Flaw of Averages. Steve Roemerman, who has surveyed the best (and worst) practices of organizations in this regard, finds that computer simulation is almost a necessity for meaningful risk management.

Factor Analysis of Information Risk (FAIR), for example, is a simulation based framework developed by Jack A. Jones for information security. A simulation is like an accounting system in which the elements (e.g., assets and liabilities etc.) are not numbers but uncertainties. Our mission at ProbabilityManagement.org has been to develop the Hindu-Arabic numerals of uncertainty so that simulations may be networked together across enterprises and industries. Our open SIPmath™ standard accomplishes this by representing uncertainties as arrays of simulated realizations along with meta data, which may be transferred between Excel, XML, CSV and other data formats.

In 2017 we were proud to team up with OpenGroup.org and the Economics Department of San Jose State to create a SIPmath implementation of the Open FAIR™ risk standard. We hope that this marriage of two standards can point the direction to improved communication of both uncertainty and risk. One can imagine a consolidated risk statement that includes the total monetary, safety and reputational impact of financial, operational, and information risk.

As part of this risk modeling effort, Tom Keelin and I generalized his innovative metalog distributions to encompass sums of identical lognormals. From our brief literature search, this appears to be a significant result in the field of applied probability.

Also, this year we introduced an Enterprise version of our SIPmath Modeler Tools for Excel that incorporates the lognormal work cited above, and also benefits from Doug Hubbard's portable random number generator.

Most importantly, after an unexpected interruption of funding in 2017, Pacific Gas & Electric became a full member of our organization, and is sponsoring our annual conference. PG&E is pushing the boundaries of the discipline of probability management in its gas operations, and the SIPmath standard is benefitting as a result.

We thank our sponsors, partners, and supporters, and are grateful to Loring Ward for providing the venue for this year's conference. We already have commitments for 2018 that indicate that it will be the best year yet for ProbabilityManagement.org.

Sincerely,

Sam L. Savage Executive Director

San S. San O

## **Our Sponsors and Affiliates**



We gratefully acknowledge financial support from the following organizations.

## **Sponsors**

















**Foundation for Creativity in Dispute Resolution** 

**Computerlaw Group LLP** 

### **Affiliations**



## **Research Partner**

**Government Finance Officers Association** 



## **Technology Partner**



## **2017 Accomplishments**

2017 was the year that made us stronger by not killing us. After an unexpected reduction of planned sponsorship funds, we tightened our belts, and pulled together as a team to generate sustaining revenues. This in turn led to exciting new opportunities, and a sunny outlook for 2018. Below are highlights of our activities.

#### **Presentations, Workshops and Webinars**

- Financial Executives International, Silicon Valley Chapter, February 2017
- Probability Management Annual Meeting and Conference, March 2017
- Government Finance Officers Association Annual Meeting, Denver, May 2017
- National Institute of Standards and Technology, September 2017
- Northrup Grumman two-day workshop with Doug Hubbard, September 2017
- US Marines 1.5 day workshop, September 2017
- Chevron two-day workshop with Doug Hubbard, November 2017
- Numerous webinars, including guest presenters

#### **New Sponsor**

We welcome Pacific Gas & Electric as our latest corporate sponsor. PG&E is pushing the boundaries of the discipline of probability management in its gas operations, and the SIPmath standard is benefitting as a result.

#### **Media Coverage**

Dr. Sam Savage and Kennan Scott, West Oakland middle school teacher, were featured in a segment on NBC Bay Area News. http://bit.ly/bap0420

#### A marriage of standards: SIPmath and Open FAIR

In 2017 we were proud to team up with OpenGroup. org and the Economics Department of San Jose State to create a SIPmath implementation of the Open FAIR™ risk standard. OpenGroup.org is a standards organization which holds the Unix standard, among many others. We teamed up with Mike Jerbic of San Jose State, and his student Danny O'Neil to develop a flexible Excel Template based on the FAIR taxonomy. If you think of FAIR as an accounting standard, then SIPmath is the Hindu-Arabic number system for performing the arithmetic of uncertainty.

The Risk Tool and associated documentation is available for download as described below.

I181: The Open FAIR™ Risk Analysis Tool Beta (90-day Beta Evaluation License) www.opengroup.org/library/i181
This record includes the Tool itself and the User's Manual.

G180: Open FAIR™ Risk Analysis Process Guide www.opengroup.org/library/q180

G181: Open FAIR™ Tool with SIPmath™ Distributions: Guide to the Theory of Operation www.opengroup.org/library/g181





01234 56789





#### **Generalized Metalogs**

Dr. Tom Keelin of Keelin Reeds Partners has developed an elegant family of probability distributions called Metalogs (http://metalogdistributions.com/), which are particularly well suited to simulations based on actual data. As part of our work on the risk model above, Tom and I developed a generalized form of the metalog, which among other things can simulate the sum of an arbitrary number of independent lognormal distributions. From our brief literature search, this appears to be a significant result in the field of applied probability.

We have already incorporated Generalized Metalogs into the SIPmath Modeler Tools. Furthermore, coupled to the HDR random number generators of Doug Hubbard, metalogs have the potential to be incorporated into the SIPmath standard, with deep implications.

## Enterprise version of our SIPmath™ Modeler Tools for Excel

Thanks to Hubbard's HDR family of seedable, interactive random number generators in 2016, the SIPmath tools became a fully functional Monte Carlo package. In 2017 we introduced a paid Enterprise version for Windows, which is fully upward compatible from our free version for Windows and Mac. Both versions create interactive simulation models in Excel, which perform thousands of iterations per keystroke without requiring the tools to be present to run the models. A comparison of the two versions appears below.

SIPmath™ Tools 3rd Generation	Free Version	Enterprise
Creates interactive simulations in Excel that run without macros or add-ins using the data table. Can perform thousands of trials per keystroke.	<b>✓</b>	<
Seed-able real time random number generator using native Excel formulas from Hubbard Decision Research.	✓	<b>✓</b>
16 distributions, including Poisson and Tom Keelin's Metalog.	✓	✓
Uses Cholesky factorization to generate correlated normal or uniform variables. The latter may be used with other variates, such as Poisson etc.		<b>✓</b>
Creates models with up to 1 million trials and hundreds of output cells (but not at once).	<b>✓</b>	<b>✓</b>
Multi-Experiment mode: runs multiple simulation experiments with a single output cell to experiment with key parameters of the model.		<b>✓</b>
Save current simulation results to Excel SIP library.	<b>√</b>	<b>✓</b>
Import and Export SIP libraries to or from XML, CSV or JSON for interchange with R, Matlab or nearly any environment supporting arrays.		<b>✓</b>
Import SIP libraries from @RISK and Crystal Ball models.		<b>\</b>
Includes one hour of technical support.		<b>✓</b>

## **2018 Proposed Activities**

In 2018, ProbabilityManagement.org will continue to improve the communication and calculation of uncertainty through education, best practices, and our open SIPmath™ standard.

#### **Lockheed Martin**

After an interruption in funding from Lockheed Martin in 2017, they have redoubled their commitment to ProbabilityManagement.org in 2018 with a program aimed at education and outreach.

#### **Website Update**

We have just updated our website to Squarespace, which will allow us greater flexibility in adding and updating content. For example, we have just set up a blog page called Limbic Analytics, which is devoted to connecting the seat of the intellect to the seat of the pants. The page is also now linked to our Linkedln Group, which is becoming more active.

#### **Enterprise Tools**

Our SIPmath Modeler Tools are unprecedented in that they create simulations that run in native Excel. The free version for Mac and Windows will remain, but the paid Enterprise version can both generate enough revenue to support its further development, and also provide incentives for attending workshops and through site licenses with sponsors. In 2018 we plan to expand the support of Tom Keelin's Metalog distributions, and possibly add a distribution fitting module based on Metalogs. Furthermore we have already had requests for academic licenses for this tool, and plan to promote its use in education. SIPmath is already in use at West Point, the Naval Postgraduate School, Stanford and Georgia Tech.

#### **Workshops and Webinars**

We will continue to offer workshops and webinars both on our own, and in conjunction with our sponsors.

#### **Public Relations**

With communities of practice in the discipline of probability management now at Chevron, Lockheed Martin, PG&E and the Military, we believe that we have the critical mass to engage in a focused public relations campaign. The SIPmath Tools alone are of great value to business and government, but currently in use by a minute fraction of their potential audience. We plan to work in concert with our sponsors to get the word out on the auditable communication of uncertainty.

## **Board of Directors**



#### Sam L. Savage Executive Director and Chairman of the Board

Sam L. Savage led the development of the open SIPmath standard for storing probability distributions as auditable data. Sam is also the author of The Flaw of Averages: Why We Underestimate Risk in the Face of Uncertainty, and is a



Consulting Professor at Stanford University.

After receiving his Ph.D. in computational complexity from Yale University in 1973, Sam spent a year in the Mathematics Department at General Motors Research Laboratory, and then joined the Management Science faculty of the University of Chicago Graduate School of Business. Here he discovered that an Algebraic Curtain separated the bulk of his management students from management science. In 1985, Dr. Savage led the development of software called What's Best!®, which coupled Linear Programming to Lotus 1-2-3. The package won PC Magazine's Technical Excellence Award in 1986. Since then, Sam has continued working to bring analytical tools to managers in an algebra-free environment. In 1990, Sam moved to Stanford, where he teaches Management Science in the Engineering School. He has been a Visiting Professor at Northwestern University's Kellogg School of Business and the Naval Postgraduate School in Monterey, and is a Fellow of the Judge Business School at the University of Cambridge.

Dr. Savage consults and lectures extensively to business and government agencies through his consulting firm, SIPmath Group, an AnalyCorp venture, and serves as an expert witness.

## Michele Hyndman Associate Director and Board Member

Michele Hyndman has over 20 years of public relations and communications experience. She has worked in broadcast television, at a public relations firm and was the public relations manager at Stanford University Medical School Blood Center



for over 10 years. Michele works effectively and cooperatively with people at all levels of an organization,

media and industry contacts, and vendors to achieve successful branding, media, marketing, advertising and communications plans. In 2012, she launched MMH Communications to leverage her experience and industry contacts to help other nonprofits and small businesses thrive in a highly competitive landscape. Michele is inspired by organizations that help to improve the lives of others.

As Associate Director, Michele manages communication and marketing strategies, coordinates outreach to corporate sponsors and partners, and oversees Probability Management conferences and events.

Michele holds a Bachelor of Arts (BA) in Communication and Media Studies from California State University, Sacramento.

#### Harry Markowitz Board Member

Dr. Markowitz has applied computer and mathematical techniques to various practical decision making areas. In finance: in an article in 1952 and a book in 1959, he presented what is now referred to as MPT, "modern portfolio theory." This has become a standard



topic in college courses and texts on investments, and is widely used by institutional investors and financial advisors for asset allocation, risk control and attribution analysis. In other areas: Dr. Markowitz developed "sparse matrix" techniques for solving very large mathematical optimization problems. These techniques are now standard in production software for optimization programs. Dr. Markowitz also designed and supervised the development of the SIMSCRIPT programming language. SIMSCRIPT has been widely used for programming computer simulations of systems like factories, transportation systems and communication networks.

In 1989 Dr. Markowitz received The John von Neumann Award from the Operations Research Society of America for his work in portfolio theory, sparse matrix techniques and SIMSCRIPT. In 1990 he shared The Nobel Prize in Economics for his work on portfolio theory. Dr. Markowitz is the principal of Harry Markowitz Company. He is also an adjunct professor at the Rady School of Management, UCSD.

## **Our Team**

#### June Klein Chief Financial Officer

June Klein attended University of California, Santa Barbara, where she obtained her bachelor's degree in Business Economics in 1980, and was selected as the Outstanding Graduating Senior in Economics. June became a



Certified Public Accountant in California in 1983. She was awarded an MBA focusing on Management of Technology from the Walter A. Haas School of Business at U.C. Berkeley in 1988. In 2010, June received her Doctorate in Education at Fielding Graduate University through their Educational Leadership and Change program, focusing on intercultural competence and global leadership in higher education.

Her professional memberships include the American Institute of Certified Public Accountants, and affiliations with many community groups. June is active in community service, lending her expertise in finance and business planning to her positions on the boards of the Palo Alto Family YMCA and the Kiwanis Club of Palo Alto, where she heads up fundraising/major gifts in both organizations and is very involved in their international/diversity programs. In 2017, June was appointed to the Santa Clara County Behavioral Health Board by Supervisor Joe Simitian.

June received the Andrew Carpendale Award for outstanding international achievement and the Distinguished Service Award for service and leadership in 2008 from the Palo Alto Family YMCA.

## Melissa Kirmse Director of Operations

Melissa Kirmse has over 20 years of project coordination, administrative, and technical writing experience. She has worked for various tech companies including Microsoft and TiVo. Together with Dr. Sam Savage, she coauthored the article "Probability Management



2.0," which appeared in the October 2014 issue of *OR/MS Today*. Melissa was promoted to Director of Operations at ProbabilityManagement.org in 2014. She set up an accounting system for the company and manages the day-to-day accounting. She coordinates PM's presence at

various trade shows and conferences throughout the year and manages corporate communications and logistics. Melissa graduated summa cum laude from the University of Maryland with a degree in Communication Studies.

# Dave Empey Director of Software Development

Dave Empey has more than 20 years of experience with Monte Carlo simulation. He has worked with Dr. Sam Savage since the early 1990's, and developed Monte Carlo and decision



tree software for Anadarko Petroleum Corporation, the Bessemer Trust, the NSA, Royal Dutch Shell, and Lockheed Martin, among others. With Dr. Savage, Dave has developed software for creating and manipulating Stochastic Information Packets (SIPs), and a compressed form of SIP representation called Distribution Strings.

#### Jordan Alen Technology Coordinator

Jordan Alen is responsible for the implementation and management of the website. Jordan has worked closely with Sam on projects ranging from the DARPA proposal abstract to the events scheduled at conferences. His interests include astrophysics and Toastmasters meetings.



#### Mary Claire Meijer Executive Assistant

Mary Claire Meijer supports the Executive Director and other team members by managing internal and external communications, coordinating travel, and organizing speaking and meeting schedules that are essential for the company to promote its mission. She has a background in senior care



housing, and while raising her family was actively involved in numerous volunteer efforts including multiple years of directing a large volunteer team for a 200+ member high school cross country and track program. Mary Claire graduated with a Bachelor of Arts Degree in Health and Society from Brown University.

## **Committee Chairs**



#### John Marc Thibault Chair, Standards Committee

John Marc Thibault is an independent consultant with a twenty-year practice focused on technical analysis, design and planning. His clients have included a large fraction of the Canadian federal government's



departments and a variety of high-tech companies. His earlier experience includes over a decade of marketing and technology roles at Xerox, and senior management in two high-tech startups. He has a physics degree from Loyola College in Montreal.

Author of the "Art of the Plan" blog at goodplan.ca, he is developing software and operational techniques to fix the Flaw of Averages in project planning, and to correct the systemic errors that result in high-risk plans and unattainable targets.

#### Doug Hubbard Chair, Decisions and Measurements

Mr. Hubbard is the inventor of the Applied Information Economics (AIE) method and founder of Hubbard Decision Research (HDR). He is the author of one of the best-selling business statistics books of all time, *How to Measure* 



Anything: Finding the Value of Intangibles in Business. He is also the author of The Failure of Risk Management: Why It's Broken and How to Fix It, and Pulse: The New Science of Harnessing Internet Buzz to Track Threats and Opportunities. He has sold over 100,000 copies of his books in five different languages and his books are used in courses in over a dozen major universities.

Mr. Hubbard's career has focused on the application of AIE to solve current business issues facing today's corporations. Mr. Hubbard has completed over 95 risk/return analyses of large, critical projects, investments and other management decisions in the last 20 years. AIE is the practical application of several fields of quantitative analysis including Bayesian analysis, Monte Carlo simulations, and many others. Mr. Hubbard's consulting experience and financial analysis totals over 27 years and spans many industries including pharmaceuticals,

insurance, banking, utilities, cyber security, interventions in developing economies, mining, federal and state government, entertainment media, military logistics, and manufacturing.

## Steve Roemerman Chair, Best Modeling Practices

Steven D. Roemerman is Chief Executive Officer at Lone Star Analysis. He has served on the boards of a number of corporations, authored dozens of papers on technology and management, and he holds patents in the defense, telecommunications and energy sectors. Much of his work deals



with large, complex systems, whether human institutions, computer systems, networks, or systems of systems.

He holds a degree in Applied Mathematics with post graduate studies in mathematics, business, telecommunications and signal processing. He is a Senior Member of the IEEE, a Life Member of the NDIA, and a member of the SPE.

## Matthew Raphaelson, Chair, Banking Applications

Matthew Raphaelson is a former senior finance executive in banking with 25 years industry experience. He has also served as a Director of BAI, a banking industry association focused on research, training and thought leadership. Throughout his career, he has applied



quantitative modeling and decision-making under uncertainty to launch new business initiatives and manage multi-billion dollar businesses.

Raphaelson is a graduate of the University of Michigan, with degrees in economics and political science, and holds an MBA from Stanford Graduate School of Business. He is a Trustee of the San Francisco Conservatory of Music.

## **Committee Chairs**

#### Lieutenant Commander Connor McLemore Chair, National Security Applications

Lieutenant Commander Connor S. McLemore is a designated E-2C Naval Flight Officer. He was deployed to the Persian Gulf, flying in support of Operations Southern Watch, Iraqi Freedom and Enduring Freedom, and to



the Indian Ocean and Western Pacific in support of the humanitarian Operation Unified Assistance and was the lead Navy Air Officer in the Joint Task Force Headquarters in support of Philippine Typhoon relief, Operation Damayan.

Lieutenant Commander McLemore graduated from the U.S. Naval Academy with a Bachelor of Science in Mechanical Engineering. He completed an Operations Research Masters Degree at the Naval Postgraduate School in Monterey, California. His NPS thesis was awarded the Military Operations Research Society Stephen A. Tisdale Graduate Research Award. He also completed a National Security and Strategic Studies Masters Degree, awarded with distinction, from the Naval War College in Newport, Rhode Island. He is a graduate of the Navy Fighter Weapons School (Topgun) and Naval Strike and Air Warfare Center's Advanced Mission Commander Course (AMCC).

Lieutenant Commander McLemore is an Operations Research Analyst and Section Head at the Pentagon.

#### Kennan Scott, Chair, Secondary Education

Kennan Scott was born and raised loving transportation and the New York City Subway. After receiving his Bachelors of Science in Civil Engineering from Northeastern University he bolted for the west coast and the allure of automated public transit. Shortly after arriving in the Bay Area he found work with BART, the automated transit system he coveted and began



designing transit infrastructure. It was during his time working with BART on the eBART extension that he was able to reconnect with and seek out his own emotional and social connections with transportation. In order to better serve riders, Kennan received a Masters in Urban

and Regional Planning from San Jose State University with a focus on transportation management. The son of a long tenured special education teacher, Kennan always held education in high regard. When given the opportunity to change fields and teach engineering in West Oakland, he saw this as a chance to make a difference in the black community. Kennan Scott is passionate about creating healthy communities, advancing the field of education through interdisciplinary approaches that merge planning, engineering, advocacy, and coalition building.

#### Shayne Kavanagh, Chair, Government Finance Applications

Shayne Kavanagh is the Senior Manager of Research for Government Finance Officers Association. Shayne has been developing the practice and technique of long-term financial planning for local government. In addition to working with



local governments in a consulting capacity on financial planning and risk analysis, he is the author of a number of publications on financial planning and budgeting.

## Brian Putt, Chair, Energy Practice

Brian is an Independent Consultant applying probabilistic analysis to Decision Quality practices with over 40 years' experience in Oil and Gas operations and development. He has been using and promoting the use of SIPmath for the past five years. He was instrumental



in promoting the use of SIPmath at Chevron as the Organization Capability Manager for Upstream Oil & Gas before his retirement from Chevron in 2016. He has given presentations about Decision Quality to both industry groups and Universities that have included examples of SIPmath applications. He conducts training classes on the SIPmath Tool Bar. He has developed a series of more than 40 YouTube videos discussing the use and application of SIPmath. Brian has provided valuable support in the design and testing of SIPmath over the past several years. He holds a BA in Economics from Claremont McKenna College, BS in General Engineering Stanford University, and a MS in Operations Research from Stanford University.

## **Financials**



## Statement of Operations

For the years ended December 31, 2017 and 2016

	2017	2016
	Unrestricted	Unrestricted
Income		
Corporate Contributions	42,500.00	80,500.00
Individual Contributions	3,705.00	1,730.00
Matching Gifts	500.00	2,575.00
Program Service Fees	59,267.47	47,652.21 N/A
Enterprise Tools Sales	4,000.00	
Other Income	0.37	2.24
Total Income	109,972.84	132,459.45
Expenses		
Program Services		
Education & Outreach	75,416.65	80,943.29
Standards	0.00	0.00
Tools	10,561.00	26,416.50
Program Service Support		
General & Administrative	11,482.07	16,182.83
IT	3,251.32	3,499.61
Facilities	90.00	86.00
Total Expenses	100,801.04	127,128.23
nange in Net Assets	9,171.80	5,331.22

## Statement of Cash Flows

For the years ended December 31,	2017	2016	
Cash Flows from Operating Activities			
Change in net assets	\$9,171.80	\$5,331.22	
Adjustments to reconcile change in net assets to net cash provided	by operating activit	ies:	
Accounts Receivable	\$0.00	\$0.00	
Accounts Payable	(\$300.00)	(\$2,302.25)	
Prepaid Expenses	\$0.00	\$2,965.95	
Unearned or Deferred Revenue	\$3,620.00	(\$24,391.62)	
Net cash provided by Operating Activities	\$10,812.55	(\$20,916.49)	
Cash Flows from Investment Activities			
Purchase of property and equipment	\$76.69	\$184.44	
Net cash provided by Investing Activities	\$76.69	\$184.44	
Net Change in Cash and Cash Equivalents	\$10,889.24	(\$20,732.05)	
Cash and Cash Equivalents at the beginning of the period	\$23,164.80	\$43,596.85	
Cash and Cash Equivalents at the end of the period	\$34,054.04	\$22,864.80	

## **Financials**

## Statement of Financial Position

December 31,	2017	2016
Assets		
Current Assets		
Cash and cash equivalents	34,054.04	22,864.80
Prepaid expenses and other assets	911.68	911.68
Total Current Assets	34,965.72	23,776.48
Property and Equipment	0.00	76.69
Total Assets	34,965.72	23,853.17
Liabilities  Accounts payable and accrued expenses	580.00	2,259.25
Unearned or deferred revenue	3,620.00	0.00
Total Liabilities	4,200.00	4,518.50
Net Assets		
Opening Balance Equity	2,431.25	2,431.25
Unrestricted Net Assets	19,162.67	13,831.45
Net Income	9,171.80	5,331.22
Total Net Assets	30,765.72	21,593.92
Total Liabilities and Net Assets	34,965.72	26,112.42



2017

Unrestricted

3,240.00

0.00 163.74 70.00

1,980.00

500.00

2016

Unrestricted

8,200.75

271.61 0.00 50.00

1,485.00

550.00

## **Detailed Income and Expenses**

	2017	2016	
	Unrestricted	Unrestricted	
Income			Program Service Support
Contributions			General & Administrative
Corporate Contributions	42,500.00	80,500.00	Compensation and Benefits
Individual Contributions	3,705.00	1,730.00	Office Expenses
Matching Gifts	500.00	2,575.00	Office Supplies
Program Income			Postage and Shipping
Program Service Fees	59,267.47	47,652.21	Business Taxes and Fees
Enterprise Tools Sales	4,000.00	0.00	Insurance
Other Income			Directors & Officers Insurance
Interest Income	0.37	2.24	Liability Insurance Professional Services
Tax Refund	0.00	0.00	
			Accounting Legal Fees
Total Income	109,972.84	132,459.45	Banking and Financial
Evnances			Bank Fees
Expenses			Checks
Dragram Carriaga			Online Payment Fees
Program Services Education & Outreach			Total General & Administrative
6110 · Compensation and Benefits			
· ·	E0 077 07	40.050.00	IT
6117 · Contractor Expense	52,377.97	40,059.08	Compensation and Benefits
Compensation and Benefits	52,377.97	40,059.08	Software and Hardware
Travel Expenses	0.007.40	0.540.50	Software Site Licenses
Airfare	2,967.40	6,540.58	Expensed Software and Hardw
Lodging	2,916.29	2,922.27	Depreciation and Amortization
Ground Transportation	2,124.79	1,611.67	Software and Hardware - Other
Parking	163.75	146.18	Website
Travel Meals and Entertainment	461.76	921.15	Meals and Entertainment
Internet Access	25.57	8.99	Total IT
Total Travel Expenses	8,659.56	12,150.84	
Meals and Entertainment	518.68	1.63	Facilities
Marketing and Publicity			Rent Expenses
Trade Shows	167.24	0.00	Rent - PO Box
Conferences	12,025.09	25,141.63	Repairs and Maintenance
Marketing Collateral	156.72	535.05	Total Facilities
Marketing Materials	591.28	2,256.94	T. I. I. D
K-12 Education	0.00	0.00	Total Program Service Support
Email Marketing	0.00	0.00	Total Francisco
Public Relations	850.00	450.00	Total Expenses
Other Expenses			
Books, Dues, and Subscriptions	(16.45)	348.12	Change in Net Assets
Office Supplies	86.56	0.00	
Total Education & Outreach	75,416.65	80,943.29	
Standards	0.00	0.00	
Tools			
Compensation and Benefits	10,561.00	26,416.50	
Total Tools	10,561.00	26,416.50	
Total Program Services	85,977.65	107,359.79	

2,219.00 2,042.00 820.00 2,810.00 232.43 157.13 57.51 2,256.90 558.83 11,482.07 16,182.83 595.00 483.33 1,876.47 343.16 76.69 1,799.73 446.59 184.44 are 0.00 276.25 360.00 250.00 0.00 59.27 3,251.32 3,499.61 90.00 86.00 90.00 86.00 14,823.39 19,768.44 100,801.04 127,128.23 9,171.80 5,331.22



Probability Management A 501(c)(3) non-profit organization Tax ID 46-0572110 PO Box 61045, Palo Alto, CA 94306 Visit: probabilitymanagement.org

#### Contact Us:

Sam Savage, Executive Director Michele Hyndman, Associate Director Melissa Kirmse, Director of Operations Mary Claire Meijer, Executive Asisstant sam@probabilitymanagement.org michele@probabilitymanagement.org melissa@probabilitymanagement.org maryclaire@probabilitymanagement.org