ASA Section on Lifetime Data Science

LiDS Newsletter

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In Brief

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Membership in the LiDS
If you have an interest in life history data you are invited to join.

LiDS Officers

Chair:	Jianwen Cai
Chair-Elect:	Nicholas Jewell
Past Chair:	Richard Cook
Secretary 2019-2021:	Joan Hu
Treasurer 2016-2019:	Chiung-Yu Huang
Program Chair (2019):	Guoqing Diao
Program Chair-Elect :	Zhezhen Jin
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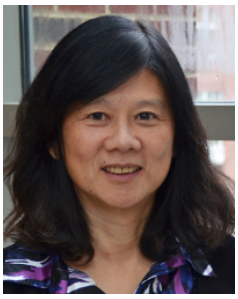
Chair's Message



Welcome to ASA's newest Section on Lifetime Data Science (LiDS)! I am very honored to serve as the Chair of LiDS in its first year as an ASA section. The objective of LiDS is to promote and support the development, application and appropriate use of statistical methods for the design and analysis of studies of life history processes. This includes supporting the development of new methods, identifying new areas of application, and fostering interdisciplinary research in areas such as biomedical research, finance, economics, imaging, engineering, genomics, and genetics.

The creation of LiDS has been a long, but rewarding, journey. We started as the Lifetime Data Analysis Interest Group (LIDA-IG) in 2014 under the direction of inaugural Chair Ross Prentice, who was succeeded by Mei-Ling Ting Lee (2015), Jack Kalbfleisch (2016), Mei-Cheng Wang (2017), and Richard Cook (2018). Through their collective vision and leadership, the interest group quickly became active in sponsoring major conference events. The interest group held a highly successful inaugural 2017 Conference on *Lifetime Data Science: Data Science, Precision Medicine and Risk Analysis with Lifetime Data*. The scientific program committee for the conference was chaired by Mei-Cheng Wang and Jack Kalbfleisch, and the event was graciously hosted by the University of Connecticut.

The enthusiasm for the creation of the LIDA-IG quickly led to a membership of over 230 individuals, and this enthusiasm and commitment were instrumental in the approval of our section! The ASA Council of Sections voted in the fall of 2018 to grant the LIDA-IG official ASA Section status as the Section on Lifetime Data Science (LiDS). I came to the application process of the section status at the last stage when Richard Cook became the 2018 LiDA-IG Chair. It was amazing how much had been done by the collective effort under the leadership of our previous chairs. I am honored to be involved in the last steps of the application.

We thank our members for joining the LIDA-IG and for their support during the section application process. We urge the current ASA members to join LiDS when renewing your ASA membership. For non-ASA members, we encourage you to join ASA and LiDS. We hope everyone can spread the word to fellow peers and colleagues about joining LiDS.

An exciting event this year is the 2019 LiDS conference on *Lifetime Data Science: Foundations and Frontiers* to be held at the University of Pittsburgh from May 29–31, 2019. Thanks to Richard Cook, Program Chair, and his committee for an exciting scientific program including short courses, scientific presentations, and student paper and poster competitions. Also, special thanks to Ying Ding and Yu Cheng, Chair and co-Chair of the Local Organizing Committee, who will provide more details of the conference in their entry later in this newsletter. We hope to see many of you at the conference!

I want to take this opportunity to thank Mei-Cheng as she steps off the executive committee for her influential leadership over the past three years. She has led the group with incredible energy and enthusiasm and has put in tremendous efforts in progressing the application for ASA section status. She, together with Jack, also organized a hugely successful 2017 LIDA-IG conference, which played a major role in the ASA section application. Your contributions to LIDA-IG are amazing and we

are grateful for your effort, Mei-Cheng. We hope to benefit from your involvement in LiDS activities in the future.

Richard has been a remarkable and efficient Chair for LIDA-IG over the past year leading various efforts including organizing the 2019 LiDS conference and applying for ASA section status. The ASA section application was successful under his leadership. I am very happy to continue working with Richard in the coming year. We congratulate Nick Jewell on his election as Chair-Elect, Joan Hu as Secretary, and Zhezhen Jin as Program Chair-Elect and welcome them to the executive committee.

Hearty thanks also go to Jonathan Siegel for completing his term as Secretary. Jonathan served as the LIDA-IG Secretary during 2015–2018. He played an important role in keeping the executive committee organized, creating the charter, and making sure that all the rules were followed. He was a crucial member in the application process for ASA section status. Thank you, Jonathan!

Sincere gratitude also goes to Weiliang Qiu for completing his term as Webmaster. He diligently maintained the LIDA-IG website since 2015 and did an excellent job. Ker-Ai Lee is our new LiDS Webmaster this year and she has already done a great job in transitioning the LIDA-IG website to the LiDS website (check it out!).

Special thanks also go to Yu Shen for completing her term as Program Chair. She has ensured the profile of our group was high through sponsorship of sessions at the Joint Statistical Meetings. We welcome Guoqing Diao as our 2019 Program Chair.

This will be a busy and exciting first year for LiDS, from the planned conference to student paper competitions to planning many other LiDS activities. I am eager to work with the members of the executive committee and the members of LiDS. We look forward to growing our section and to better serving the needs of the statistical community for lifetime data science. For more news and information about LiDS, please visit LiDS website: `https://community.amstat.org/lids/home`.

The ASA Section on LiDS has many exciting years ahead of us. We encourage you and your colleagues to join and get involved!

Best wishes for a healthy and prosperous 2019!

Jianwen Cai, Chair 2019

Message from the Past Chair

It has been a great privilege and pleasure to work with the exceptional group of people on the Executive Committee (EC) for the Lifetime Data Analysis Interest Group (LIDA-IG) this past year. The shared interest, dedication, and commitment to getting things done exhibited by all members of the EC was incredibly inspiring, and I very much enjoyed getting to know the fellow officers and members of the LIDA-IG.

Mei-Cheng Wang followed her remarkably productive year as Chair with lots of energy, ideas, and full engagement as Past-Chair. As Chair in 2017 she had a wonderful "can do" attitude and did indeed accomplish an enormous amount which we continue to benefit from greatly. During this past year Mei-Cheng was a constant source of encouragement, helpful information, and inspiration and I am pleased to have this opportunity to thank her personally for all that she has done and for making my year as Chair so pleasant.

Special thanks go to Jonathan Siegel who completed his term as Secretary, during which he played a central role in the creation of the charter for the section as well as ensuring meetings were scheduled and ran smoothly, minutes were accurate, and timelines were met. He often provided an important industry perspective which has bearing on many aspects of our activities and plans for our future. In particular, he put together an invited session on "estimands", a topic of great interest and importance in the pharmaceutical and regulatory arenas, for the program of the 2019 Lifetime Data Science conference (more on that later). Jonathan, along with Mei-Cheng, was also an active participant in the meeting with the Council on Sections of the ASA at the Joint Statistical Meeting when our case was presented for the creation of our section. The dedication and support of Chiung-Yu Huang and Jun Yan was also greatly appreciated at that meeting, and throughout the year. Bill Notz and Theresa Utlaut of the ASA Council of Sections provided important guidance on how to navigate the policies and procedures of the ASA. Ultimately the careful foundational work of past officers of the LIDA-IG, this recent team effort, and the enthusiasm of our members led to the creation of the ASA Section on Lifetime Data Science!

Yu Shen has served the LIDA-IG admirably as Program Chair and I would like to thank her very much for her dedication, while welcoming Guoqing Diao to the EC as 2019 Program Chair. Lastly, congratulations and sincere thanks to Nick Jewell, Joan Hu, and Zhezhen Jin who were elected as 2019 Chair-Elect, Secretary and 2019 Program Chair-Elect respectively.

I hope you all plan to attend the 2019 Conference on Lifetime Data Science: Foundations and Frontiers, hosted by the University of Pittsburgh May 29-31. An exciting program has developed which will be posted on the conference website in the coming weeks along with instructions for registration. The entry later in this newsletter by Ying Ding and Yu Cheng, Co-Chairs of the Local Arrangements Committee respectively, provides further information. Jianwen Cai (Co-Chair, Program Committee) and I ask that you let your colleagues know about the conference to hold the dates in your calendar!

In transitioning into our status as a new ASA Section on Lifetime Data Science, we could not be in better hands than we are with Jianwen as the 2019 Chair. It has been a joy to work with you these past months Jianwen, and I hope your year ahead is as fun as mine was in 2018!

I look forward to seeing many of you at the 2019 conference in Pittsburgh and wish you the best for 2019.

Richard Cook, Chair 2018

Message from Outgoing Secretary

Most offices in an ASA section or interest group are for one or 2 years, but the LIDA secretary is 3 years. It's a bit of a mixture of things. The secretary keeps agendas and minutes for meetings and maintains the membership list (something our new 2019–2021 Secretary, Joan Hu, won't have to do). But it has also involved drafting charters, negotiating their content

with folks from the Council of Sections, and attending council of section meetings.

This has given me the unique opportunity present both at LIDA's original meeting with the ASA council of sections in 2015, and at the recent one in 2018. LIDA has come a long way in the meanwhile. In the 2015 meeting the Council of Sections was quite skeptical of us, wondering whether we were going to simply poach members from other sections and whether we would be able to put together a set of activities that would be of real interest to members. Would LIDA be able to attract new members to ASA? Isn't time-to-event analyses one of those old-fashioned methodologies that has more or less run its course? And shouldn't the ASA be investing its resources in something more current?

We've come a long way since then. One reason is that our field is absolutely bursting with activity. In my own niche, pharmaceutical statistics, the first update to regulatory guidance in 20 years makes navigating time-dependent "intercurrent" events the centerpiece of its attention, making concepts and methods first introduced in the context of survival analysis central to its approach. Causal inference has had huge implications and consequences in a survival context. Our field is of greater interest and importance than was suspected three years ago. A second reason has been the dedication of the successive leadership teams I've been privileged to be part of these past 3 years. We put together a truly amazing conference in 2017 that exceeded all our expectations, and this year's conference could do even better.

There are areas where we could improve. In a field that has applications all over industry, in quality and reliability, pharmaceuticals, finance, and much else, we could use a lot more industry participation in our membership, leadership, and conferences. We need to build up other aspects of our educational program. But we have built a foundation in these initial years that will help give our successors a securer future.

I wish Joan and the rest of the 2019 LiDS leadership team the best of success, and look forward to a bright future for our section.

Jonathan Siegel, Secretary 2015–2018

Election 2018 Results

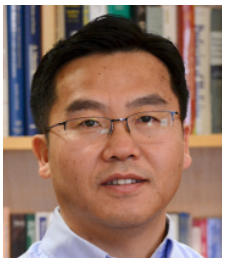
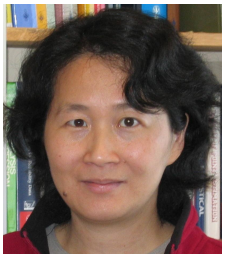
This year a slate of outstanding candidates were identified for the 2018 LIDA-IG Election: two candidates for Chair Elect, two candidates for Program Chair Elect, and two candidates for Secretary. The election was managed by the American Statistical Association — we thank Mr. Rick Peterson, ASA Officer, for helping us to run election in both 2017 and 2018. The results of the 2018 LIDA-IG election are

2019 Chair-Elect: Nicholas Jewell

2019 Program Chair-Elect: Zhezhen Jin

2019–2021 Secretary: Joan Hu

Congratulations to Professors Nicholas Jewell, Zhezhen Jin and Joan Hu on their successful election outcome. We look forward to working with them. We would also like to thank

Professors Rebecca Betensky and Drs. Ying Qing Chen and Rajeshwari Sundaram for participating in this election and for allowing their names to stand.

The Nominations Committee consisted of Bin Nan (Past program Chair and Member of the Nomination Committee), Xiaonan Xue (Member of the Nomination Committee) and Mei-Cheng Wang (2017 LIDA-IG Chair and Chair of the Nomination Committee).

Mei-Cheng Wang, Nomination Committee Chair

Report from the Annual General Meeting at JSM 2018

LIDA's very last annual meeting as an interest group took place at JSM at the Vancouver Convention Center in Vancouver, BC on Tuesday, July 31 at 5 pm. As a section, LiDS will continue to hold annual meetings at JSM, just as LIDA did. Our meetings are listed in the JSM conference program. About 42 people attended this year's meeting, slightly more than last year.

Richard Cook, our 2018 Chair, welcomed attendees and served as MC. He took us through a brief introduction to LIDA's history, started by Ross Prentice in 2014, with distinguished former chairs including Mei-Ling Ting Lee, Jack Kalbfleisch, and Past Chair Mei-Cheng Wang. We introduced and discussed our 2018 officers, including Chair-elect (and 2019 Chair) Jianwen Cai, treasurer Chiung-Yu Huang, Program chair Yu Shen, Program-Chair Elect Guoqing Diao, Newsletter Editor Jun Yan, Web Master Weiliang Qiu, and myself (Jonathan Siegel) as Secretary.

Mei-Cheng, Past Chair and Nominations Committee Chair, discussed election procedures for the then-upcoming 2018 elections. (As a section, LiDS election procedures will be different.) Guoqing, our 2018 Program Chair-Elect and 2019 Program Chair, issued a call for proposals for the 2019 JSM. As an interest group, LIDA was entitled to sponsor a topic-contributed session at each JSM including in 2019. As a section, it will be entitled to sponsor an invited session to future JSMs.

Richard discussed plans for our upcoming 2019 Lifetime Data Science Conference to be held at the University of Pittsburgh in Pittsburgh, PA, May 29–31, 2019. Richard will be serving as Conference Chair. The theme for this year's conference is Lifetime Data Science: Foundations and Frontiers. Keynote speakers will include Odd Aalen, Danyu Lin, and Ross Prentice. A slate of interesting and topical short courses is planned by leading experts in methods and applications, and there will be student paper and poster competitions with awards for best presentations. Richard also issued a call for session proposals. For more information about the program, contact Richard at `rjcook@uwaterloo.ca` and at `lids2019-program@uwaterloo.ca`.

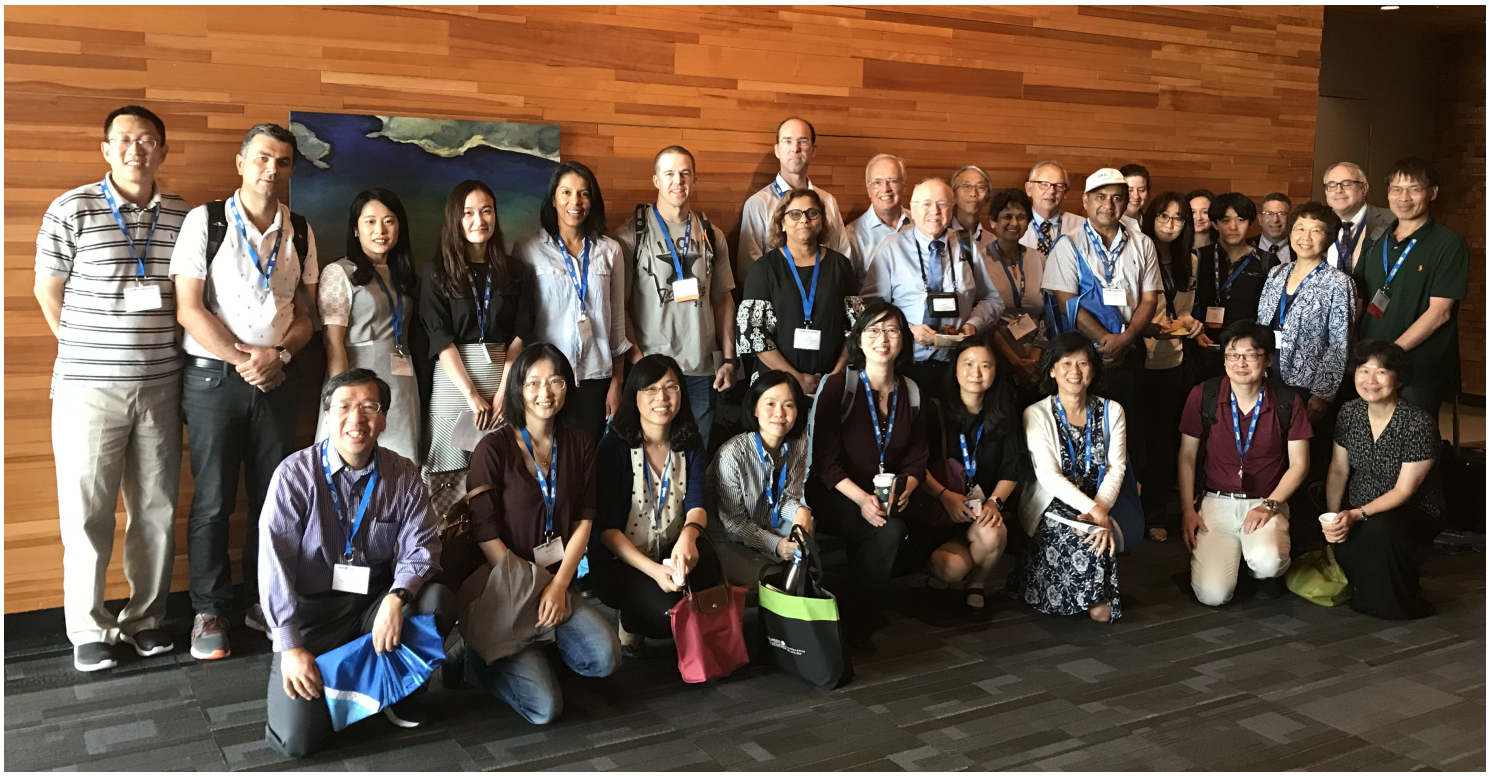


Figure 1: Participants of the annual interest group meeting at JSM 2018 in Vancouver, Canada.

Chiung-Yu gave a brief treaurer's report. Our 2017 conference at the University of Connecticut in Storrs, CT was highly successful financially as well as in terms of participation and learning. Proceeds of this conference resulted in a surplus of $14,228.33 as of the annual meeting, providing initial funding for the 2019 conference and a boost to LiDS' activities as a section. Funds will be transferred to an ASA account when ASA takes over our banking as part of the section arrangements.

Jun presented the newsletter. LIDA has had a successful semi-annual newsletter updating on activities and conferences and providing additional articles of interest including book reviews and regulatory topics. We are looking for people to write new articles for us on topics of member interest, and would welcome contributions.

Mei-Ling Ting Lee, 2015 LIDA chair and editor-in-chief of the Lifetime Data Analysis Journal, introduced winners of the 2017 awards for most-cited papers in the Lifetime Data Analysis journal published 2015-2017. The winning papers are detailed in the entry later in this newsletter by Mei-Ling Ting Lee, Editor-in-Chief of journal.

Jonathan (myself) discussed the status of our application for section status and discussed the differences between an interest group and a section. ASA provides sections a broad range of services including an invited session at JSM, financial and membership accounting, legal assistance, full support of elections, conference supports, and other bookkeeping and support services which will make our 2019 volunteer officers' jobs easier and enable us to accomplish more as a section. However, ASA requires ASA membership for section members, and expects sections to charge membership dues to help defray the costs additional support brings. As volunteer officers, we have come to appreciate the expertise and professionalism that ASA support staff provides, and believe access to these resources will be enormously helpful to enabling our work to flourish.

Jonathan also provided a membership report. As of the annual meeting, LIDA had 354 members, of whom 250 were ASA members and 104 non-members. 88% of the ASA members supported the petition for section status. As a new section, LiDS begins the year with zero members. We ask each of you reading this newsletter to add LiDS as a section when you renew your ASA membership. If you are not currently an ASA member, we encourage you to join ASA and LiDS. We will continue to send our newsletter, as we are doing now, to non-ASA members who are interested in our activities.

William Nott, Vice-Chair of the ASA Council of Sections, graciously gave us an opportunity to ask questions and discuss our section status with him. We look forward to seeing all of you at the LiDS Annual Section Meeting at the 2019 JSM in Denver, CO.

Jonathan Siegel, Secretary 2015–2018

LiDS Charter Update

We did it! We finally became a section.

As part of our section application, we had a new section charter approved by the ASA Council of Sections, and negotiated somewhat on the details before they approved it. Wanted to give you an update on this process.

From the outside, the LiDS section will look pretty much the same as the LIDA interest group did. We'll still have annual meetings at every JSM and a biennial conference. We'll still have pretty much the same officers. The main difference that you'll see is that ASA will be handling our elections, and while we'll continue to involve anyone interested in our conferences, newsletters, educational programs, etc., only ASA members will be able vote or be considered members of LiDS. We'll also need to charge dues.

Internally, there are a lot more differences. As a section we will get ASA support for many more things than we did before. ASA handles our banking and accounting, our elections, provides event planning and support for conferences, legal help if we need it, and much else.

ASA imposes more formality its sections than it does on interest groups. Officers and committees will have to behave more like the board of a corporation, with formal votes to spend money, fill vacancies, and a number of other things that could be done without a fuss before. Our secretary will have more work to do documenting that these formalities are complied with. Committees will need to file reports, and we'll generally just have to do more paperwork to satisfy the ASA. While previously our chair, conference chair, etc. had a lot of latitude to spend money, a committee will now need to take a vote before we can spend a dollar. The section charter also provides for more institutional continuity. While under the interest group charter only the treasurer and secretary had 3-year terms, for sections 3-year staggered terms are required for most committee members. We'll learn to adjust.

Although ASA will manage balloting, elections will work similarly to before, with a nominating committee that finds qualified candidates to run for offices, and an opportunity for members to add additional candidates to the ballot by petition. All offices that were elected before will continue to be elected. There will be two new ones, an elected program chair, and a new council of sections representative who will represent us and vote at ASA council of sections meetings.

This is a big adjustment on our part, and a lot of learning curve for the new officers. The upside to all this is that we will have a lot of help with conferences, educational programs, and other activities. Having the ASA's backing will be a huge advantage. In addition to help putting together our own conferences, websites, etc., JSM gives us an automatic platform to showcase the latest developments in lifetime data. We'll have some growth pains, but we think the move will be a huge benefit in the long term.

Our new charter also comes with a new statement of purpose. Our new objective is "to promote and support the development, application and appropriate use of statistical methods for design and analysis of lifetime data and time-to-event data, including analysis of time-to-event data with censoring, truncation and competing risks, counting processes, multi-state, multiple or clustered events, and longitudinal biomarker histories, and quality-of-life models." This includes supporting the development of new methods, identifying new areas of application and appropriate use, and fostering interdisciplinary research. We look forward, with your help, to bringing all these aspects of our mission to life.

Jonathan Siegel, Secretary 2015–2018

We Are a Section!

In October 2018, the ASA Council of Sections (COS) approved Lifetime Data Science as a new section of the ASA. It has been over 4 years since the initiation of the Lifetime Data Analysis Interest Group (LIDA-IG). It took a lot of vision, remarkable dedication, and hard work of our leaders and members to make this happen. Here is a collection of what they want to share at this milestone (in alphabetical order).

Chiung-Yu Huang, Treasurer 2016–2019: It is a special honor and privilege to be involved in LIDA-IG's section application process. I was recruited by Mei-Ling Ting Lee in 2014 to serve as the treasurer of the LIDA-IG — I happily agreed because Mei-Ling told me that the interest group had no money or any bank account to manage. The past 4 years have been eventful for LIDA-IG, although less so for the treasurer. After failing the first attempt of section application in 2015, LIDA-IG organized a very successful conference at the University of Connecticut (UConn) in 2017 with the help from Ming-Hui Chen, Jun Yan, and colleagues at UConn. The conference resulted in a healthy surplus while charging a low registration fee. That's when the treasure started to have some fund to oversee, with the restriction that the fund has to be spent through UConn. Now as a formal section and with access to the expertise and professionalism of the ASA support staff, we will need to quickly adapt to the new system. Following the dedication of our former and current leadership team, I look forward to the new challenges and joys ahead of our new LiDS section.

Zhezhen Jin, Program Chair 2019: The upcoming establishment of the LiDS section is great news for all ASA members, especially those interested in the lifetime data sciences. It is the fruit of great effort and dedication of the members of the LiDS interest group over the years. I am honored to be elected to serve as program-chair of the newly approved LiDS section. Although times have changed to the current Big Data era, the development and proper application of statistical methods for lifetime data has continued to be in great demand. I look forward to working closely with section officers and members to promote and enhance the prosperity and success of this section. Happy New Year!

Jack Kalbfleisch, Chair 2016: When I came on the scene, much of the preliminary work had been done by Mei-Ling Ting Lee and Ross Prentice. They had the vision of developing the Lifetime Data Analysis Interest Group and potentially the ASA section by that or a similar name. It was a great pleasure to become Chair of the Interest Group in 2016 following Mei-Ling who had, by then, taken on the Presidency of the Chinese International Statistical Association. During that year, we were able to begin the Newsletter under Jun Yan's editorship, substantially increase our membership, and begin reporting on our growth and activities to the Council of Sections. My successor was Mei-Cheng Wang who also was the driving force behind the very successful conference held at the University of Connecticut in June of 2017. I was particularly pleased to oversee two elections for the Interest Group that led to the elections of Richard Cook and Jianwen Cai as the 2018 and 2019 Chairs. It has been a great pleasure to be associated with this effort and to see its evolution into the Lifetime Data Science Section of the ASA this year.

Mei-Ling Ting Lee, Chair 2015: In 1994, with help from the ASA Boston Chapter, I organized the "International Conference on Lifetime Data Models in Reliability and Survival Analysis" at Harvard University in Cambridge, Massachusetts. It was successfully held with more than 200 participants from 22 countries. At the meeting, the late Professor Alan Gross suggested that, with so many people interested in this topic, it

would be good to apply to ASA to create a section. My life has been busy with many things and hence I did not think about it much until 20 years later when I realized that we do need a section to have a group voice in the ASA and its meetings.

I wrote to Rick Peterson in 2014 inquiring about rules and procedures for creating a section. Thanks to everyone's support, by early 2015 we had collected more than 100 email sign ups and signed a slate of starting officers for the proposed section on Lifetime Data Analysis, including Ross Prentice the Chair, Jack Kalbfleisch the Chair-Elect, Douglas Schaubel, Zhezhen Jin, Xin He, and Chiung-Yu Huang. Thanks to these starting officers and some 20 participants who attended, the first Lifetime Data Analysis Interest Group (LIDA-IG) meeting took place at the JSM in August 2015 in Seattle to initiate the section creation process. Ross also attended Council of Sections (COS) meetings answering questions. Jack Kalbfleisch chaired the group in 2016, and Mei-Cheng Wang chaired in 2017. Jonathan Siegel replaces Xin He as the Interest Group Secretary, and Weiliang Qiu serves as the Webmaster. Jun Yan, as the Editor, creates a very professional Newsletter for group members. It was great that Ming-Hui Chen and Jun Yan organized the first Interest Group conference at the University of Connecticut. Because of health problems and a schedule conflict, however, I could not attend the Connecticut meeting, but I heard that it was very successful and helped further strengthen bonds among members of the group. Under the leadership of Jack and Mei-Cheng, everything was in good shape in the Charter and formal elections were conducted smoothly. Richard Cook was elected as Chair 2018. Congratulations to Jianwen Cai who was elected as Chair 2019, and Nicholas Jewell as the Chair-Elect.

Following trends in the field, the Interest Group has updated its name to the Lifetime Data Science (LiDS) Group. Thanks to continued efforts of officers and many people who offered help over the years, we are glad that, after the 2018 JSM meeting in Vancouver, COS approved LiDS as a new section of the ASA. We hope that the new LiDS Section will bring attention to this important area of statistics, create opportunities for young researchers, and provide an expert forum for advancing the field.

Ross Prentice, Chair 2014: We owe a strong vote of thanks to Mei-Ling Ting Lee for both initiating and shepherding the process leading to the Lifetime Data Science ASA section. I helped Mei-Ling a little with the first pass at Section approval, but when ASA responded that we should be an Interest Group instead, at least for a time, I lost patience. But Mei-Ling persisted, enlisting the valuable help of Jack Kalbfleisch, Mei Cheng Wang and others. It's great to see a successful outcome for a branch of statistics and biostatistics that has many diverse and important application areas, and many diverse methodology development challenges.

Jonathan Siegel, Secretary 2015–2018: I'm incredibly excited that we have finally achieved our goal of becoming a section. We have spent an enormous amount of time and work on this. As a volunteer officer, I've come to really appreciate the professionalism and expertise of the ASA support staff. Having their help fully on board will lift an enormous weight off the incoming officer team, and give us a big boost so we can focus all our efforts on advancing the discipline, fostering and disseminating research, improving the quality of statistical practice, and educating members, professionals, and the public. I want to thank our early Chairs, Ross Prentice, Mei-Ling Ting Lee. and Jack Kalbfleisch for starting the momentum going back in 2015 that led to where we are today. I also want to thank co-chairs Ming-Hui Chen and Jun Yan for putting together a truly amazing LIDA conference in 2017.

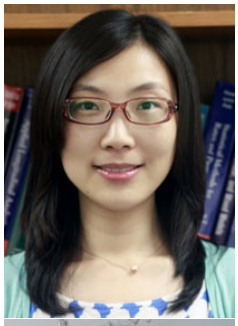
Mei-Cheng Wang, Chair 2017: I would like to express my thanks to Mei-Ling Ting Lee and Ross Prentice for their dedicated effort to initiate the application process, which has led to the eventual success for approval of LiDS (Lifetime Data Science) Section. I was not involved in the initial attempt of application and started to be engaged when Jack Kalbfleisch became the 2016 LIDA-IG Chair. Under the leadership of Jack, a loosely organized group gradually became an organized interest group with established rules. In 2017, with the help from colleagues at University of Connecticut (Ming-Hui Chen, Jun Yan and others), the LIDA-IG sponsored a conference on Lifetime Data Science at the University of Connecticut: `http://archive.stat.uconn.edu/lida17/index.html`. The success of this conference has subsequently provided a strong evidence to show 'good activities' when the ASA evaluated our application for Section status. The LIDA-IG, which will soon become the LiDS-Section, is now in good hands of Richard Cook (2018 Chair) and Jianwen Cai (2019 Chair). The two Chairs have been actively organizing the second conference which will take place at the University of Pittsburg in 2019. As the lifetime data research covers a very broad spectrum of topics and extends to many interdisciplinary areas, it is important that ASA recognizes us as a Section so we will have a proper share of resources to promote research in LiDS. Congratulation to all of us — we are a Section now!

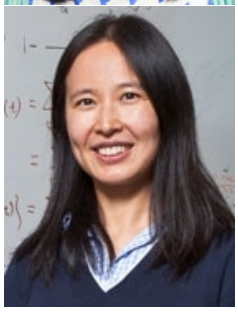
Jun Yan, Newsletter Editor: It was a privilege to witness the evolution of the LIDA-IG into a formal ASA section on LiDS at so close a range as the editor of the LIDA, now LiDS, Newsletter in the past few years. Thank Mei-Ling Ting Lee who recruited me for this job, I got the precious opportunity to work closely in person with a group of dedicated people, many of whom I had only known before from their publications. I got to know them outside of lifetime data analysis, observing how they handled challenging issues, such as the unsuccessful application for section status in 2015, and how they inspired people around them to accomplish what needed to be accomplished. I learned a great deal from working together with the leadership team. The section creation experience will become handy in other scenarios. The editing job does take some time, but is truly rewarding. The connections that I made is a whole new dimension in my network. I am very grateful for having been a part of the formation of the LiDS section by putting my editorial skills into good use.

2019 Conference on Lifetime Data Science in Pittsburgh

The 2019 conference on Lifetime Data Science will be held at the University of Pittsburgh on May 29–31, 2019 (Wednesday to Friday), following the successful inaugural conference at the University of Connecticut in 2017. The 2019 conference will feature 3 workshops, 3 plenary talks, a poster session, and 45+ invited sessions on a broad range of topics in lifetime data science. The reception will be held on May 29, 2019 with a poster competition, and the banquet will be held on May 30,

2019, both at Wyndham Pittsburgh University Center.



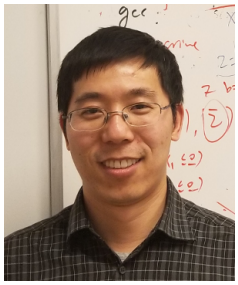


The workshops will be given by leading experts in methods for lifetime data analysis. Jing Qin (NIH) will give a workshop on "Biased Sampling, Left Truncation, and Survival Analysis." Ornulf Borgan (University of Oslo) and Sven Ove Samuelsen (University of Oslo) will lead a workshop on "Two Phase Studies for Lifetime Data," and Hein Putter (Leiden University) will give a workshop on "Dynamic Prediction Using Landmarking." Our distinguished keynote speakers include Dr. Odd Aalen from the University of Oslo, Dr. Danyu Lin from the University of North Carolina-Chapel Hill, and Dr. Ross Prentice from the University of Washington. The conference will contain many invited sessions on a broad range of topics in lifetime data science.

We are currently accepting submissions for student paper competition. All PhD candidates or graduates during the 2018 calendar year are eligible to apply. Up to four awards will be offered to the outstanding student papers. Each winner receives a certificate, a waived conference registration fee, a waived tuition fee for one short course of their choice, and a $500 award. Please visit our conference website `http://lids2019.pitt.edu/` for more information.

Ying Ding and *Yu Cheng*, Co-Chairs, Local Organization

JSM 2019 Program Update



LIDA-IG was invited to participate in a competition for an invited session for the Joint Statistical Meetings (JSM) in Denver, Colorado — to be held July 27–August 1, 2019. Thanks to the JSM Program Committee, one invited session with LIDA-IG as the primary sponsor, "Statistical methods for composite time-to-event endpoints", organized by Dr. Lu Mao, was accepted for the JSM 2019 invited program. Those proposals not selected as invited sessions were entered into the competition for topic-contributed sessions.

Since LIDA-IG became an ASA Section on Lifetime Data Science (LiDS), we received two allocations for topic-contributed sessions. One selected proposal with LiDS as the primary sponsor, entitled "Recent advances in lifetime data analysis", was organized by Dr. Mei-Ling Ting Lee. The other selected proposal, "Estimand framework and its impact on drug development in oncology", was co-organized by Dr. Kaspar Rufibach and Dr. Evgeny Degtyarev. This proposal was co-sponsored by LiDS. If you missed the deadline this year, please consider starting early for next year and choose LiDS as one of the sponsors.

The Program Committee for LiDS is soliciting proposals for an invited session and two topic-contributed sessions for the 2020 JSM in Philadelphia, Pennsylvania, to be held during August 1–6, 2020.

Guoqing Diao, Program Chair 2019

News from Lifetime Data Analysis

Every year, Springer summarizes a publisher's report for the articles published in *Lifetime Data Analysis*. From the report of 2018, the 4 top-cited articles published 2015–2017 were

1. "Does Cox analysis of a randomized survival study yield a causal treatment effect?" by Odd O. Aalen, Richard J. Cook, and Kjetil Roysland, Vol. 21 Issue 4 (Oct. 2015)
2. "Parameter inference from hitting times for perturbed Brownian motion" by Massimiliano Tamborrino, Susanne Ditlevsen, and Peter Lansky, Vol. 21 Issue 3 (July 2015)
3. "Penalized variable selection in competing risks regression" by Zhixuan Fu, Chirag R. Parikh, and Bingqing Zhou, Vol. 23 Issue 3 (July 2017)
4. "Regression analysis of informative current status data with the additive hazards model" by Shishun Zhao, Tao Hu, Ling Ma, Peijie Wang, and Jianguo Sun, Vol. 21 Issue 2 (April 2015)

The top-downloaded article published in 2017 was

> "Penalized variable selection in competing risks regression" by Zhixuan Fu, Chirag R. Parikh, and Bingqing Zhou, Vol. 23 Issue 3 (July 2017).

Mei-Ling Ting Lee, Editor-in-Chief, Lifetime Data Analysis

Note from Industry — Estimands Guidance Update

Last year, I wrote about an initiative by the major pharmaceutical industry regulatory authorities to update their guidance for statistical practice for the first time in 20 years. The Food and Drug Administration (FDA) and the European Medicine Agency (EMA) are introducing an addendum to the 1998 guidance for industry, "Statistical Principles for Clinical Trials" [E9]. The addendum, which went through a round of comments last year and is still in draft, is called "Estimands and Sensitivity Analyses in Clinical Trials" [E9(R1)]. The centerpiece of this guidance is the concept of intercurrent events, an idea that has long been a central part of survival analysis. Intercurrent events are in general events which prevent observing or confound observation of the event of interest. Classically, these events have been assumed to be noninformative and censored. Clinical trial empiricists have increasingly challenged noninformativity assumptions, arguing that events like withdrawal from study or inability to come to the clinic for observation can often be highly related to treatment outcomes. The estimands guidance creates a framework for defining and evaluating treatment effects in the context of informative intercurrent events. While its impact has yet to be determined, the major challenges to foundational and routinized assumptions it incorporates present a potential sea change to clinical trial design and analysis, especially in the field of lifetime data.

In response to this development, a group of pharmaceutical industry statisticians led by Evgeny Degtyarev of Novartis and Kaspar Rufibach of Roche organized a Pharmaceutical Industry

Working Group on Estimands in Oncology, consisting of 30 members (13 from Europe and 17 from the US) representing 18 companies, with additional regulatory liaison participation from the EMA. I have had the privilege of representing my company, Bayer, in this group. The group seeks to understand the guidance, engage in dialog with regulatory authorities, develop an industry position, and educate.

The group has been meeting regularly and actively, reading papers, discussing, and educating ourselves. The group will be presenting sessions at a number of conferences in 2019 in the US and Europe, including LiDS, JSM, and DAGStat. As Guoqing Diao notes in his JSM 2019 Program Update article, LiDS will be sponsoring the JSM session, "Estimand framework and its impact on drug development." And the chair of the EMA Statistics Working Group recently accepted our request to begin a dialog with them, and we had the privilege of spending some time discussing the EMA's view of what the guideline portends.

The guidance has the potential to address problems that have been vexing industry for some time. An example is crossover effect in post-marketing survival trials. When a drug receives accelerated approval based on a surrogate endpoint like progression-free survival (PFS), regulatory authorities typically require survival trials to confirm the initial effect. But once a product is approved, subsequent trials become harder to conduct, as patients can simply cross over and receive the approved treatment outside the context of the trial at any time. High crossover rates can devastate study power. The estimands guidance provides a potential path to use causal inference methods to address the issue. As another example, regulatory authorities require radiological documentation of progression, but clinical symptoms may make it inadvisable to continue the study until radiological progression is documented. In settings where this is especially likely to occur, the guidance potentially allows consideration of additional options and means of selecting the best one available.

The approach is likely to make clinical trial design more dependent on context and on clinical knowledge of context, as the optimal strategy may be different depending on tradeoffs in censoring rates, informativeness of censoring, etc. Navigating these issues is likely to require more cooperation between clinicians and statisticians, and both greater clinical awareness on statisticians' part and more awareness of statistical issues on clinicians' part.

These developments provide opportunities for statisticians to help guide companies through opportunities for new options. Although change may well come slowly, and the reliability of alternative strategies will need to be demonstrated, the guidance opens the discussion and provides a path by which new solutions to previously unsolvable problems can potentially become acceptable. Statisticians as always will need to be the fulcrum balancing industry's need for innovative solutions to vexing problems with the ever-present regulatory need for reliability and assurance of reproducibility. The opportunity to do this in new ways, to rethink foundational assumptions of our field, is an exciting development which makes our field more interesting and potentially more rewarding, and also much more complex and challenging, than before.

The Industry Working Group will be presenting a session on estimands at the 2019 LiDS conference in Pittsburgh in May. We would be happy to discuss these issues with any interested LiDS members.

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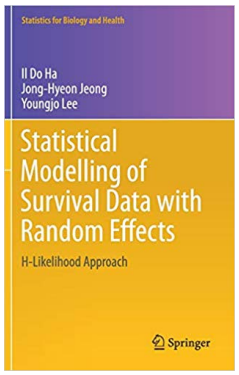
Book Review

Statistical Modelling of Survival Data with Random Effects: H-Likelihood Approach

Il Do Ha, Jong-Hyeon Jeong, and Youngjo Lee.
Publisher: Springer, 2017. ISBN: 978-981-10-6555-2.



This book discusses strategies for adopting the h-likelihood approach to conduct statistical inference on correlated survival data. This generic approach obviates the need for handling intractable integrations, which is typically encountered by traditional methods for computing the working likelihood. Another advantage of using the h-likelihood over existing methods is that it can handle subject-specific inferences on random effects.

The decidedly readable, informative book is thorough in its treatment of the underlying methodologies but also oriented towards applied researchers. The book first begins with several motivating examples of correlated survival data which explain the need for survival models with random effects such as frailty models, frailty models with competing-risks, and mixed effect models. Basic methodologies in survival analysis for modelling and analyzing univariate survival data are provided in Chapter 2. The use of the h-likelihood method to simultaneously estimate the population parameters and the random effects is amply illustrated with various models and settings in subsequent chapters. In particular, Chapter 3 gives a general introduction to the h-likelihood methods for random-effect models. Extended likelihood inferences as well as its connection with the h-likelihood approach are also reviewed from both the frequentist and the Bayesian perspectives. Inference procedures on simple frailty models with one frailty term on survival data subject to right censoring and left truncation are aptly discussed in Chapter 4, followed by their extensions to multicomponent frailty models in Chapter 5. Inferential problems on competing-risks frailty models via both cause-specific hazards and subdistribution hazards specification are discussed in Chapter 6. The last few chapters in this book cover more recent development of the h-likelihood method including variable selection procedures using the penalized h-likelihood (Chapter 7), AFT models with random effects (Chapter 8), repeated measures data (Chapter 9) and competing-risks models for multistate data with potential missing causes of failure (Chapter 10).

The authors did an excellent job in providing a systematic review of the h-likelihood. The thoughtful use of real data examples, accompanied by R syntax and output, makes the

book tremendously accessible. Readers can easily implement the corresponding procedures by using the functions included in `frailtyHL` package that is available from CRAN. The text is easy to follow and written at a level appropriate for graduate students in (bio)statistics. The book is also an extremely useful resource for applied medicine and biostatistics researchers who are interested in working with clustered survival data with potential competing risks components.

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Software Review

Solving Non-Smooth Estimating Equations in R

Nonsmooth estimating equations occur frequently in statistical modeling. Some well known examples include rank-based linear regression of censored data (Wei, 1992), quantile regression with censored data (Koenker, 2008), and quantile regression in competing risks settings (Peng and Fine, 2009). Nonsmooth estimating equation, $U(\beta; X) = 0$, where X denotes an observable random quantity, i.e. the data, and β is a vector of unknown parameters to be estimated. The function $U(.\,; X)$ is non-smooth and hence standard numerical techniques such as Newton's or quasi-Newton's method for root-finding do not work well. We had previously demonstrated the effectiveness of a derivative-free spectral gradient approach, with a non-monotone line search, for solving the non-smooth estimating equations arising in the context of rank-based linear regression with censored data (Varadhan and Gilbert, 2009). This algorithm called DF-SANE was originally developed by (La Cruz, 2006) and has been implemented in an R package **BB** (Varadhan and Gilbert, 2009). Here we demonstrate the use of the function `BB::dfsane()` for the benefit of the readers of this column.

The accelerated failure time (AFT) model is a useful alternative to the popular Cox relative risk model for the analysis of failure time data subject to censoring. The AFT model relates the logarithm of the failure time to a linear function of the covariates, and hence the model has direct physical interpretation in terms of the failure time. Let T_i be the failure time, and $X_i \in \mathbb{R}^p$ be the corresponding covariates for the ith individual $(i = 1, \ldots, n)$. The semi-parametric AFT model may be written as:

$$\log T_i \;=\; X_i^\top \beta \,+\, \epsilon_i; \quad (i = 1, \ldots, n),$$

where $\beta \in \mathbb{R}^p$ is a vector of regression parameters to be estimated from the data, and ϵ_i are independent errors with a common, but unspecified, probability distribution. Let C_i be the censoring time for ith individual. It is usually assumed that C_i is independent of T_i, given X_i. Let $T_i^* = \min(T_i, C_i)$ and $\delta_i = I(T_i \le C_i)$, where $I(.)$ is the usual indicator function. The data then comprises (T_i^*, δ_i, X_i), $i = 1, \ldots, n$. The regression parameters β are estimated by solving the weighted log-rank estimating function

$$U(\beta) = 0 \tag{1}$$

where

$$U(\beta) = \sum_{i=1}^{n} \delta_i \, \phi_i \left\{ X_i - \frac{\sum_{j=1}^{n} X_j \, I(T_j^* - X_j^\top \beta \ge T_i^* - X_i^\top \beta)}{\sum_{j=1}^{n} I(T_j^* - X_j^\top \beta \ge T_i^* - X_i^\top \beta)} \right\},$$

and ϕ_i is a possibly data-dependent weight function. The choice of $\phi_i = 1$ yields the log-rank estimator, and $\phi_i = n^{-1} \sum_{j=1}^{n} I(T_j^* - X_j^\top \beta \ge T_i^* - X_i^\top \beta)$ yields the Gehan estimator.

We show here how `dfsane()` can be used for solving the semi-parametric AFT equations (1). We can implement the above estimating equation in a vectorized manner as follows:

```
aft.eqn <- function(beta, X, Y, delta,
                    weights = "logrank") {
  deltaF <- delta == 1
  Y.zeta <- Y - c(X %*% beta)
  ind <- order(Y.zeta, decreasing = TRUE)
  dd <- deltaF[ind]
  n <- length(Y.zeta)
  tmp <- apply(X[ind, ], 2, function (x) cumsum(x))

  if (weights == "logrank") {
    c1 <- colSums(X[deltaF, ])
    r <- (c1 - colSums(tmp[dd, ] /
                       (1:n)[dd])) / sqrt(n)
  }

  if (weights == "gehan") {
    c1 <- colSums(X[deltaF, ]*
                  ((1:n)[order(ind)][deltaF]))
    r <- (c1 - colSums(tmp[dd, ])) / ( n * sqrt(n))
  }
  r
}
```

We apply the AFT model to a data set that has been widely used in survival analysis: Mayo Clinic's primary biliary cirrhosis (PBC) data. This data is available in the R package **survival**. We computed the regression coefficients for an AFT model with 5 covariates, age, log(albumin), log (bilirubin), edema, and log(protime), with log-rank and Gehan weights.

```
library(survival)
myData <- with(
    survival::pbc,
    data.frame(time = time, delta = status == 2,
               age   = age,
               logAlbu = log(albumin),
               logBili = log(bili),
               edema   = edema,
               logProt = log(protime)))
myData <- na.omit(myData)
X <- model.matrix(~ age + logAlbu + logBili +
                    edema + logProt - 1,
                  data = myData)
Y <- log(myData$time)
delta <- myData$delta
```

Then we call the `dfsane()` function to solve Equation (1). For more details about function `BB::dfsane()` and its control arguments, please refer to Varadhan and Gilbert (2009).

```
options(digits = 4, warn = -1)
library(BB)
## Gehan weights
system.time(
  pbc.gh <- dfsane(par = rep(0, ncol(X)),
                   fn = aft.eqn,
                   weights = "gehan",
                   control =
                       list(M = 50, noimp = 500,
                                    trace = FALSE),
                   X = X, Y = Y, delta = delta)
)

##    user  system elapsed
##   2.207   0.145   2.496

pbc.gh$par

##      age  logAlbu  logBili    edema  logProt
## -0.02537  1.59873 -0.55598 -0.91454 -2.69565
```

It may be noted that the rate of convergence is slow, although the correct solution obtained. We would like to mention two other packages for estimation of the AFT models. First, the package **faft** implements a novel Newton-type method for solving the estimating equations (Huang, 2013), available at `http://web1.sph.emory.edu/users/yhuang5/software`. This has a much faster convergence than DF-SANE. Another major advantage of **faft** is that it also provides estimates of standard errors for the parameters. On the other hand, we have to resort to bootstrap while using `dfsane()`.

```
library(faft)
system.time(
  pbc.faft.gh <- faft(Y, delta, X, weight = "gehan")
)

##    user  system elapsed
##   0.010   0.001   0.017

pbc.faft.gh$beta

## [1] -0.02551  1.49811 -0.55814 -0.92391 -2.77776

sqrt(diag(pbc.faft.gh$va))

## [1] 0.005948 0.510200 0.065518 0.216914 0.755568
```

The other package is **aftgee**, available from `https://github.com/stc04003/reReg`. It contains a function `aftsrr()` with an interface similar to the popular function `coxph()` in the **survival** package, which can be used to estimate AFT models (Chiou, Kang, and Yan, 2014). In fact, it uses `dfsane()` to compute the estimates, although it smooths the estimating equation before solving it using the induced smoothing approach of Brown and Wang (2007); non-smooth equation solving can be requested by setting option `eqType = "ns"`.

```
library(aftgee)
system.time(
  pbc.aftsrr.gh <- aftsrr(
      Surv(time, delta) ~ age + logAlbu + logBili +
          edema + logProt,
      data = myData,
      rankWeights = "gehan", B = 0,
      control=list(M=50)
  )
)

##    user  system elapsed
##   2.063   0.008   2.084

pbc.aftsrr.gh$beta

## [1] -0.03564  1.45368 -0.62546 -0.92169 -3.08950
```

In summary, the `dfsane()` function in the R package **BB** can be a useful general purpose tool for solving non-smooth estimating equations. However, for rank-based estimation of the AFT model specifically, it appears that the **faft** package is highly effective.

References

Brown, BM and Wang, Y-G (2007). Induced smoothing for rank regression with censored survival times. *Statistics in Medicine*, 26, 828–836.

Chiou SH, Kang S, Yan J (2014). Fitting accelerated failure time models in routine survival analysis with R package aftgee. *Journal Statistical Software,* Vol 61, Issue 11.

Huang Y (2013). Fast censored linear regression. *Scandinavian Journal of Statistics,* 40: 789–806.

Koenker R (2008). Censored quantile regression redux. *Journal Statistical Software,* Vol 27, Issue 6.

La Cruz W, Martinez JM, Raydan M (2006), Spectral residual method without gradient information for solving large-scale nonlinear system of equation. *Mathematics of Computation*, 75: 1429–48.

Peng L and Fine JP (2009), Competing risks quantile regression, *Journal of American Statistical Association*, 104: 1440–53.

Varadhan R. and Gilbert P. (2009). BB: An R package for solving a large system of nonlinear equations and for optimizing a high-dimensional nonlinear objective function. *Journal of Statistical Software*, Vol 32, Issue 4.

Wei LJ (1992). The accelerated failure time model: a useful alternative to the Cox regression model in survival analysis. *Statistics in Medicine,* 11: 1871–79.

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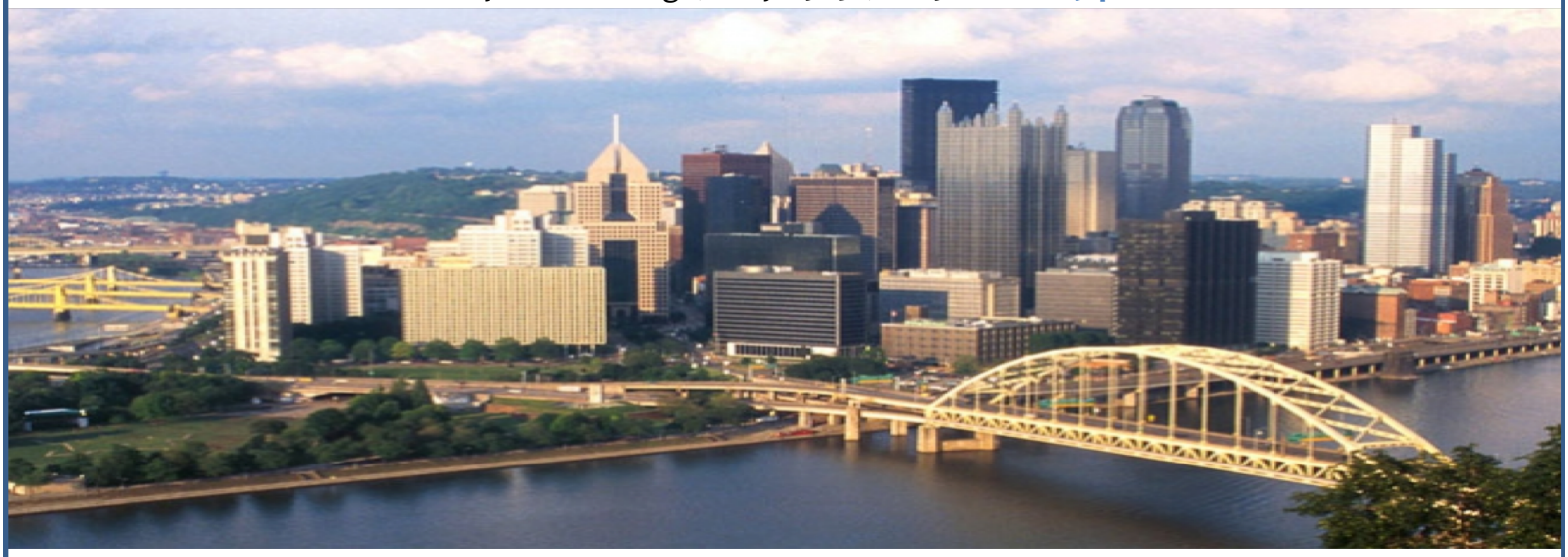
Lifetime Data Science: Foundations and Frontiers

A Conference of the New ASA Section on Lifetime Data Science (LiDS)
University of Pittsburgh, May 29–31, 2019: **lids2019.pitt.edu**



Keynote Speakers

Odd Aalen
University of Oslo
Causal Inference for Survival Data, with Emphasis on Mediation Analysis

Danyu Lin
UNC-Chapel Hill
Semiparametric Regression Analysis of Interval-Censored Data

Ross Prentice
Hutchinson Cancer Center
Regression Models and Multivariate Life Tables

Short Courses

Two Phase Studies for Lifetime Data, **Ornulf Borgan and Sven Ove Samuelsen** (University of Oslo)

Dynamic Prediction in Survival Analysis, **Hein Putter** (Leiden University)

Biased Sampling, Left Truncation and Survival Analysis, **Jing Qin** (NIH)

The new Section on Lifetime Data Science of the American Statistical Association is pleased to announce an exciting upcoming conference on *Lifetime Data Science: Foundations and Frontiers* which will be held at the University of Pittsburgh, May 29-31, 2019. The event will begin with short courses by experts in topics of current interest on May 29, and will be followed by a two-day conference featuring keynote addresses by internationally renowned statisticians, a student paper competition, a poster session and many stimulating talks. A banquet will be held on May 30, 2019.

The Scientific Program Committee is lead by Richard Cook (Chair, U Waterloo) and Jianwen Cai (co-Chair, UNC). Ying Ding (Chair, U Pittsburgh) and Yu Cheng (co-Chair, U Pittsburgh) are leading the Local Arrangements Committee.

See the conference website for information on how to register for the short courses and conference, accommodation, and the student paper competition: **lids2019.pitt.edu**

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