

# Wisconsin Illinois SAS® Users

## Conference Brochure

June 14, 2023  
8:30 a.m. – 5:00 p.m.

Women's Club of Wisconsin, Milwaukee WI  
[813 East Kilbourn Avenue, Milwaukee, WI 53202](#)

Join us in-person on June 14th for a day of presentations, including three tracks covering SAS® tutorials, tips, and techniques from SAS experts and other SAS users like you.

[Register here!](#)

Cost to attend:

- Business/Industry and Government:
  - o \$90 on or before May 31, after that \$150
- Education
  - o \$30 student (with valid student ID)
  - o \$45 faculty/staff

[Presentations and trainings will cover topics such as:](#)

Code optimization \* Data Visualization \* Handling Missing Values \* Smart Commenting \*  
Communicating about Analytics to Clients and Stakeholders \* SAS Hash Objects \* Penalized  
Regression \* PROC SQL \* SAS Macro Language \* Functions for Data Cleaning and Manipulation \*  
Set-Merge-Update \* Getting Involved in Industry Initiatives \* Base Procedures \* Graphic  
Inventions \* Generating Fantastic Reports

[With your registration, you'll receive:](#)

- Free valet parking
- Networking
- Continental breakfast, lunch and post-conference social



<https://www.wiilsu.org/>

## Presenter Bios and Abstracts

in Alphabetical Order by Presenter Last Name

### *LeRoy Bessler, Ph.D.*



LeRoy Bessler, author of the book “Visual Data Insights Using SAS® ODS Graphics: A Guide to Communication-Effective Data Visualization”, is a consultant, on-site trainer, data analyst, programmer, application developer, data visualization aficionado, and data artist. He has supported SAS servers, SAS software, SAS data, and SAS users, concurrent with his own work as a SAS practitioner. His special interests are data visualization, and software-intelligent application development for reliability, reusability, maintainability, extendability, and flexibility to deliver Strong Smart Systems™.

#### LeRoy’s Presentations

##### ❖ **Data Visualization by Design: Chart Smart and Show Them What’s Important**

Get beyond the defaults. Dispel the fog. Let the data talk. Familiar graphs can be done different, but better. Learn from my long and ongoing quest to get the best of SAS graphics, and my recent exploration and demonstration of EVERYTHING that SAS ODS Graphics can do. This paper is based on my January 2023 book “Visual Data Insights Using SAS ODS Graphics: A Guide to Communication-Effective Data Visualization”, with design principles (48 for graphs, 23 for color), examples (327), code (all of it). This presentation focuses on three principles. (However, examples will implement all principles relevant.)

See the universe of plots, charts, or graphs you can create. Packaging multiple graphs in panels, lattices, and matrices is possible, and in the book, but out of scope for this paper. Instead, see “Anything Anywhere All At Once: Output Graphs, Tables, and Text As Any Composite You Wish” later today at this conference. Create graphs that are easily and quickly interpreted, without ambiguity. And deliver maximum information in the product.

Bonus: The paper includes a macro to reduce coding for one aspect of every custom graph you will ever make.

##### ❖ **Anything Anywhere All At Once: Output Graphs, Tables, and Text As Any Composite You Wish**

SAS® ODS Graphics is unlimiting and empowering. You can put anything anywhere on the page for a composite. Divide the display area however you wish, and imbed whatever suits your communication objective: graphs, tables, text, photos, logos, etc. Your output can be a standalone image, or programmatically imbedded in Microsoft Word, PowerPoint, Excel, or PDF. You can make an infographic, anything visual. Build a poster. Look at my poster here today.

##### ❖ **My UNpatented Graphic Inventions: You Can Do These, Too**

Most of these creations are unlike anything else out there. Others are derivatives to do the job differently and/or better. All expand The Possible. This session is not about code. The code is in my book. I will show you the examples, explain the rationale in design and construction, and invite your feedback. How can they be made better? Is there anything that you can’t find a way to do with SAS® ODS Graphics?

##### ❖ **Why and How to Use SAS® Macro Language**

SAS® Macro Language and macro variables (a.k.a. symbolic variables) let your SAS program do things for you that would ordinarily require you to make manual changes to your code every time you run it (e.g., changing title text, changing data filters, graph controls, etc.)

Whenever you change your code, not only does it take extra time, but also there is a risk of inadvertently introducing an error. (Continued on next page.)

SAS Macro Language makes code situation-adaptive. It can adapt to changes in data, run date, data date, data date range, etc. It is an essential tool for Software-Intelligent Application Development, which delivers Reliability, Reusability, Maintainability, Extendability, and Flexibility.

Strong Smart Systems are essential for production programs that are run by automatic batch scheduling or must respond in a custom fashion in real-time to interactive requests. Such programs must run correctly hands-off every time. Code using macro language also saves time and reduces error risk for ad hoc work. Any supposedly one-time ad hoc code you build has the possibility of being needed again, very likely with minor variation, to satisfy a future request for analysis, report, or data.

Programs that are basically similar, but with minor variations in purpose and output, need to differ only in macro invocation code, which is easy to find and understand, as compared to changes buried somewhere in a huge number of lines of SAS code. This introductory tutorial will get you started using a powerful feature of Base SAS software that you already have, and which can be used with all of your other SAS software products as well.

### *Nancy Brucken, IQVIA*



Nancy Brucken is a Senior Standards Engineer at IQVIA, and has been a SAS® programmer for over 30 years, most of which have been spent in the pharmaceutical industry. She has been a frequent presenter at local and regional User Group conferences.

A graduate of Marietta College, she is also a devoted Ohio State Buckeyes fan despite having a Master's degree from that school up north.

### **Nancy's Presentations**

#### ❖ **From Codelists to Format Library**

Codelist files in the pharmaceutical industry are designed to enumerate all possible values for a given variable. One common method for capturing and storing codelist information is to use the Microsoft® Excel® template generated by Pinnacle 21 Enterprise or Community, since that file is often used as the basis for analysis dataset specifications. From there, it's a short task to read the codelists from the file and convert them to SAS® formats and informats, which can be used for creating secondary numeric or character variables in analysis datasets.

#### ❖ **Getting Involved in Professional Activities**

You've been working as a programmer, statistician, or data scientist for at least a few years now. Chances are good that you have picked up some useful hints from others along the way, and you're also curious about how other people have solved some of the problems you are facing. How do you get involved in professional activities within your industry so you can start exchanging this knowledge with others? This presentation will address some of the steps the author has found helpful; while focused mostly on the pharmaceutical industry, there are parallel organizations in many other industries where SAS® users can be found. And attending WIILSU is a good first step!

**Ben Cochran**, *The Bedford Group*



After more than 11 years with SAS® Institute in the Professional Services (as an Instructor) and Marketing Departments (as Marketing Manager for the SAS/EIS product), Ben Cochran left to start his own consulting and SAS Training business in the fall of 1996 – The Bedford Group.

As a Silver member of SAS Institute’s Alliance Partner Program, Ben has been involved in many consulting projects over the last 25 years and has been teaching SAS courses since 1985.

Ben has authored and presented dozens of papers at SUGI/SGF and regional user groups on a variety of topics since 1988.

**Ben’s Presentations**

❖ **Generating Incredibly Fantastic Reports with SAS®** (training)

I just finished a consulting project which was the inspiration for this course. The client wanted their report to be 100% generated with SAS. Before this project started, it took the client almost 2 months to produce this 120+ page report. They did a lot of manual cutting and pasting, etc. After the project was completed, it only took them 20 minutes to run the SAS program that generates the full report.

The report was a single PDF file which included Graphs, tables, and lots of text manipulation to do the narrative. If you need to generate a report in SAS, this course is for you. A surprisingly large amount of the report was done with PROC REPORT.

I learned a LOT of new and exciting things (tricks) that PROC REPORT can do that I never knew before (and I have been using PROC REPORT since it came out in Version 6 SAS - around 1990), which I am including in the course material. Other procedures covered in this course include PROC ODSTEXT and PROC ODSLST.

Also, there is coverage on page layout with the ODS LAYOUT statement and how to designate regions within your page layout. This course is unlike any that I have ever written or taught (and I have been teaching SAS courses since 1985). Students should bring a thumb drive if they want an electronic copy of the presentation.

❖ **Using Functions for Data Cleaning and Manipulation** (training)

In Base SAS®, there are over 500 functions available to the user. This in-depth tutorial looks at Using Functions to Manipulate, and Clean data. If time allows, we will also discuss using Functions in the SAS Macro Facility. This course consists of lectures with ample time for hands-on exercises. There are no prerequisites for this session. Attendees can be new SAS Users as well as seasoned SAS professionals. An electronic copy of the manual can be made available via email or given to attendees who bring a thumb drive.

**Brooke Delgoffe**, *Marshfield Clinic Research Institute, Marshfield Clinic Health System*



Brooke Delgoffe has been a Research Programmer/Analyst at Marshfield Clinic Research Institute since May 2017. She prepares high quality data, coming from a variety of data domains, for use in MCHS research. Her favorite studies also call on exploratory and graphical representations of the data and close collaboration with principal investigators. She received her Professional Science master’s degree in Biostatistics from Grand Valley State University in 2017. She completed her master’s internship at MPI Research, a pre-clinical trial pharmaceutical contract research organization, where she provided statistical support in over 100 studies. Brooke received her bachelor’s degree, also from GVSU, in Psychology and Applied Statistics in 2015. An original interest in occupational therapy has also given Brooke a clinical background with multiple internships and practicums in this domain.

## Brooke's Presentation

### ❖ Coding for the Future: Smart Commenting

We have no idea what is coming to SAS® programming in the future, but most of us have worked with multiple author, multiple time period, conglomerate code written over multiple versions of SAS. How do we bridge the gap between versions, time, and programmers? It's commenting. Properly commented code makes renovating, adding to, or reviewing code much easier. It is one of the only ways to talk to the future and make it easier for the next person, next version of SAS, or next version of you to pick up where you left off.

There's an art to commenting in a way that is meaningful. While keeping commented out code may provide insight into what was already tried, it may also clutter the program and leave the next programmer to wonder why it was commented out. Future area of development? Attempt that didn't work? In the same way, commenting what was done could be helpful to novice programmers who may pick up complex code later, but true code renovation requires a full view of why something was done in addition to what. Single option methods used today could be replaced by a more efficient method or accompanied by many other ways in later years.

This paper and/or presentation will explore different methods of commenting your code in a meaningful way for programmers of the past, present, and future.

#### *Jane Eslinger, SAS*



Jane Eslinger is a Senior Technical Training Consultant at SAS® Headquarters in Cary, North Carolina.

Jane has authored two books: *The SAS Programmer's PROC REPORT Handbook: Basic to Advanced Reporting Techniques* and *The SAS Programmer's PROC REPORT Handbook: ODS Companion*. Her SAS certifications include Advanced Programmer for SAS9, SAS Certified Data Scientist, and SAS Certified Advanced Visual Business Analyst.

She has presented at numerous conferences and users' groups across the US, including SAS Global Forum from 2015 to 2019. Before joining SAS, Jane served as a statistician and statistical programmer in the social science and clinical research fields. She earned her BS in Statistics from NC State University.

### ❖ It's All about the Base—Procedures, Parts 1 & 2

As a Base SAS® programmer, you spend your day manipulating data and creating reports. You know there is a procedure that can give you what you want. As a matter of fact, there is probably more than one procedure to accomplish the task. Which one should you use? How do you remember which procedure is best for which task?

This paper is all about the Base procedures. It explores the strengths of the commonly used, nongraphing procedures. It discusses the challenges of using each procedure and compares it to other procedures that accomplish similar tasks and when to choose one procedure over another. It also provides example code to demonstrate how to get the most out of the procedure that you choose.

#### *Jay Iyengar, Data Systems Consultants LLC*



Jay Iyengar is director of Data Systems Consultants LLC. He is a SAS® consultant, trainer, and SAS Certified Advanced Programmer. He was co-leader and organizer of the Chicago SAS Users Group (WCSUG) from 2015-19. He's presented papers and training seminars at SAS Global Forum (SGF), Midwest SAS Users Group (MWSUG), Wisconsin Illinois SAS Users Group (WILSU), Northeast SAS Users Group (NESUG), and Southeast SAS Users Group (SESUG) conferences. He has been using SAS for over 25 years. His industry experience includes Health care, Public Health, Pharmaceutical, International Trade, Marketing and Education.

## Jay's Presentations

### ❖ Best Practices for Efficiency and Code Optimization in SAS® programming

There are multiple ways to measure efficiency in SAS® programming; programmers' time, processing or execution time, memory, input/output (I/O) and storage space considerations. As data sets are growing larger in size, efficiency techniques play a larger and larger role in the programmers' toolkit. This need has been compounded further by the need to access and process data stored in the cloud, and due to the pandemic as programmers find themselves working remotely in distributed teams. As a criterion to evaluate code, efficiency has become as important as producing a clean log, or expected output. This presentation explores best practices in efficiency from a processing standpoint, as well as others.

### ❖ If it's not broke, don't fix it; existing code and the programmers' dilemma

In SAS® shops and organizational environments, SAS programmers have the responsibility of working with existing processes and SAS code which projects depend on to produce periodic output and results and meet deadlines. Some programming teams still cling to the old adage; if it's not broke, don't fix it. They've come to depend on code which runs clean and is reliable. However, besides processing with no errors and warnings, there are other criteria to judge the quality of a SAS program.

Programming guidelines dictate that code should be well-documented, readable, and efficient, and conform to best practices. This presentation challenges the conventional wisdom that code which works shouldn't be modified.

## Russ Lavery



Russ is a SAS® partner and a multiple award-winning presenter on SAS and statistical topics. He has presented at conferences and companies in the U.S. Europe and Asia.

### Russ's Presentations

#### ❖ Explaining Logistic Regression to a Client

This presentation contains discussions of issues associated with logistic regression where the issues are easier to understand when presented graphically than when they are presented using formulas. The topics discussed are: 1) odds are not probabilities or percents, 2) complete and partial separation, 3) why do we use the logit (What do the estimates in SAS® printouts mean), 4) the effect of beta values on the percent curve, 5) plotting the managerial effects of betas using 2 dimensions, 6) oversampling – why and how 7) the C statistic.

#### ❖ Explaining the ROC Curve to a Client

The ROC curve is often taught to students without any explanation. I've seen teachers ONLY say that the area under the ROC curve for a random process is 0.5 and a good model has an area greater than 0.5. This presentation provides deeper insight into the logic underlying the ROC curve and hints for new uses.

#### ❖ Penalized Variable Selection and Quantile Regression in SAS®: Overview

This presentation is about some PROCs for modeling using penalized variable selection and some PROCs for building models that are a richer description of your data than OLS. The four PROCs we will cover are: Reg, GLMSelect, QuantReg and QuantSelect. The presentation explains theory and gives examples of SAS code and output for four PROCs.

## *Melodie Rush, SAS*



With over a decade of experience in data analytics and machine learning, Melodie Rush brings a wealth of expertise to her role as an Customer Success Data Scientist. Her passion for solving complex problems with innovative technology has made her an essential member of the SAS® team. Melodie's work involves developing and deploying advanced models that help businesses make better decisions based on their data insights. She is constantly exploring new ways to improve analytical methods and technologies, striving to create systems that are faster, more accurate, and more efficient than ever before. In addition to her technical skills, Melodie is also known for her ability to communicate complex concepts in simple terms.

### **Melodie's Presentations**

#### ❖ **Handling Missing Values in SAS®**

There are multiple ways to measure efficiency in SAS programming; programmers' time, What do you do when you have missing values in your data? In SAS we have many ways to manage missing values. In this session we cover what are missing values, why and when missing values occur and how to manage missing values. We discuss functions, procedures and how different products deal with missing values.

#### ❖ **SAS® and Python**

Yes, SAS and Python do work together. Whether you are using SAS 9 or the new SAS Viya Platform, you can leverage your Python and SAS knowledge to solve your analytical challenges. This session covers using SAS packages available on GitHub: SASPy, SWAT and Pipefitter.

## *Chris Schacherer, PhD.*



Chris Schacherer [shocker] is a healthcare analytics consultant & educator and an advocate for the use of operational data to inform healthcare quality improvement, improve patient outcomes, and enhance organizational effectiveness. While completing his Ph.D. at Rice University, Dr. Schacherer began working in the world-renowned Texas Medical Center, and has spent his career helping payers, providers, hospitals, and medical associations develop metrics, policies, and practices to improve the delivery of healthcare. A SAS® user since 1988, Chris loves sharing his knowledge of SAS technology and its history with other SAS users.

### **Chris's Presentations**

#### ❖ **Introduction to SAS® Hash Objects**

The SAS hash object is an incredibly powerful technique for integrating data from two or more datasets based on a common key. This presentation describes the basic methodology for defining, populating, and utilizing a hash object to perform lookups within the DATA step and provides examples of situations in which the performance of SAS programs is improved by their use. Common problems encountered when using hash objects are explained, and tools and techniques for optimizing hash objects within your SAS program are demonstrated.

#### ❖ **PROC SQL: From Select to Pass-Through SQL**

Many data analysts and engineers begin working with SAS® as a data management and analytic tool after having developed reporting and data manipulation skills in database technology platforms. Other SAS users first learned to manipulate and integrate data using DATA STEP programming and MERGE statements—discovering PROC SQL more recently. (Continued on next page.)

For both of these groups (as well those new to SAS who do not have a background in SQL programming) this presentation provides extensive examples of using PROC SQL to extract, join (merge), summarize, and update data for reporting and analysis. In addition to presenting information on performing equi-joins, left joins, and union joins, this presentation provides in-depth explanations of the use of summary functions and "group by", "order by", and "having" clauses as well as information on inserting, updating, and deleting rows in existing SAS datasets. Finally, attendees will learn how to establish connections to remote databases using SAS/ACCESS and LIBNAME statements and how proprietary database languages such as Oracle's PL/SQL and Microsoft's T-SQL can be utilized in PROC SQL queries.

### *Erik Tilanus*



Erik Tilanus holds an Msc from Eindhoven University of Technology. He joined KLM Royal Dutch Airlines in 1971, working in several positions within the IT organization. In 1979 he was responsible for the introduction of SAS® to the KLM organization. Later he moved to other specialist and managerial positions within KLM. In most of those functions he continued the use of SAS. In 2003 he left KLM and started his own consultancy for smaller airlines, specializing in reservations systems and revenue management. He presented SAS basic courses and advanced courses to several organizations and wrote the book 'Working with the SAS System' based on his course notes. Currently the book is only available in the Dutch language. Erik has been a frequent (invited) speaker at the SAS Global Forum.

#### **Erik's Presentations**

##### ❖ **Set-Merge-Update**

How often do you use the SET or MERGE statement? Probably almost daily. But beyond the straightforward use these statements have many more features and ... also some traps. Then there is the UPDATE statement, less known, but powerful for a number of applications. This presentation starts with the basics and then discusses some of the additional features and traps. Then we apply these to a series of small DATA steps to discuss what the effect of those steps is.

##### ❖ **Relative Fuel Efficiency of Cars: PROC Means and PROC Freq**

Big SUV's consume more fuel than compact cars. Everybody can understand that. But also between different cars of comparable size the fuel consumption may vary a lot. Which cars are more fuel efficient than other cars? The presentation shows a method to compare the fuel efficiency of a car compared to its peers and classifies them in categories from A (most efficient) to E (least efficient).

##### ❖ **Matching Two Different Sources with SOUNDSEX**

One company, two divisions. Each with its own customers. The analysis question was simple: which of our most valuable customers is client of one of the divisions but not of the other. However... The way customers are registered is different, a straightforward merge resulted in only in 5 matches (of 4588 customers of one division and 149 of the other).

How to solve? By encoding the customer names using the SOUNDSEX algorithm and using the COMPGED function to analyze the differences between the codes, we were able to match more customers. The presentation will explain the algorithms behind the SOUNDSEX and COMPGED functions and show how these were applied.

## Conference Day Schedule

Start	End	Event Details and Location		
8:30a	10:00a	Registration & Check-in – First-Floor (East Room)		
8:30a	9:00a	Breakfast, Coffee/Tea – First-Floor (West Room)		
9:00a	9:10a	Welcome – Main Room (Upstairs)		
Conference Kickoff:				
9:10a	10:00a	Data Visualization by Design, <i>LeRoy Bessler</i>		
Section Breakouts		Section 1– Ballroom, second floor	Section 2 –Breakout Room, first floor	Section 3 – Basement
		Best Practices for Efficiency and Code Optimization in SAS Programming	From Codelists to Format Library	Anything Anywhere All At Once (training)
10:05a	10:25a	<i>Jay Iyengar</i>	<i>Nancy Brucken</i>	<i>LeRoy Bessler</i>
10:25a	10:40a			
10:40a	11:30a	SAS and Python <i>Melodie Rush</i>	Explaining Logistic Regression to a Client (analytics) <i>Russ Lavery</i>	Why and How to use SAS Macro Language (training) <i>LeRoy Bessler</i>
11:35a	11:55a	Matching 2 Different Sources with SOUNDEX <i>Erik Tilanus</i>	Explaining ROC Curve to Clients (analytics) <i>Russ Lavery</i>	⬆ SAS Macro Language training continued
12:00p	1:00p			
1:00p	1:50p	Handling Missing Values <i>Melodie Rush</i>	Penalized Regression (analytics) Russ Lavery	Generating Incredibly Fantastic Reports with SAS (training) <i>Ben Cochran</i>
1:55p	2:15p	If it’s not broke, don’t fix it; Existing code and the programmers’ dilemma <i>Jay Iyengar</i>	Relative fuel efficiency of cars: PROC Means and PROC Freq <i>Erik Tilanus</i>	⬆ Fantastic Reports, continued
2:20p	2:40p	Coding for the Future: Smart Commenting <i>Brook Delgoffe</i>	Introduction to SAS Hash Objects <i>Chris Schacherer</i>	⬆ Fantastic Reports, continued
2:45p	3:00p			
3:00p	3:50p	It’s All About the Base – Procedures <i>Jane Eslinger</i>	PROC SQL: From Select to Pass-Through SQL <i>Chris Schacherer</i>	Using Functions for Data Cleaning and Manipulation (training) <i>Ben Cochran</i>
3:55p	4:15p	My Unpatented Graphic Inventions <i>LeRoy Bessler</i>	Set-Merge-Update <i>Erik Tilanus</i>	⬆ Using Functions, continued
4:20p	4:40p	Getting Involved in Professional Activities <i>Nancy Brucken</i>	⬆ Set-Merge-Update, continued	⬆ Using Functions, continued
4:40p	5:00p	Closing	Main Room (Upstairs)	
5:00p	6:00p	Networking Social – Behind Main Room (Upstairs)		