Artificial Intelligence Workshop
Session Handbook

Workshop at the FANNP's 36th
*NATIONAL NEONATAL NURSE PRACTITIONER SYMPOSIUM*

Intended audience

This workshop is designed primarily for providers who are interested in clinical and research applications of Big Data, data analytics, and AI who are interested in learning more about using large language models, handling data, and getting an introduction to some analytic techniques using common EMR software and free open-source software tools. Prior programming or analytic experience is not required but participants should be comfortable with moderate to advanced computer skills.

Materials

The latest version of the materials (including slides, sample data, sample code, and documentation) can always be found at our GitHub site: https://github.com/Vesoulis-Lab/fannp2026/

All materials can be downloaded in a single bundle by clicking the green button marked "< > Code" and selecting "Download ZIP" from the dropdown. This will download a file called "fannp2026-main.zip". The live demonstrations will be conducted under the assumption that this file has been saved to the standard "Downloads" folder and has been extracted (unzipped).
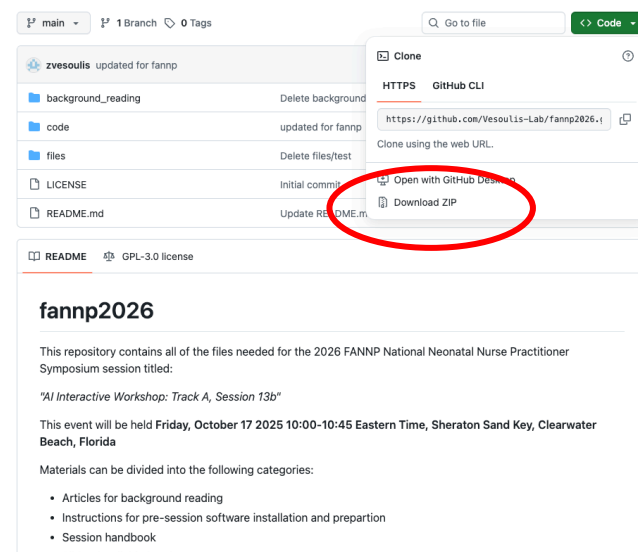
Software installation
Some of the activities will utilize two free open-source software packages: Octave and R Studio. Octave can be downloaded from: https://octave.org/download and R Studio can be downloaded from: https://posit.co/download/rstudio-desktop/. Although it is not free, attendees who have institutional access to MATLAB are welcome to use it as an alternative to Octave. MATLAB can be installed directly on your computer, or the online version can be used instead (https://matlab.mathworks.com/) Detailed instructions for installing and configuring the software can be found on our GitHub page.

The activities will also include interaction with large language model chatbots. We suggest the use of ChatGPT (https://chatgpt.com/) or Claude (https://claude.ai). Attendees should visit one or both of those websites in advance of the meeting and create a free account to streamline the activities. It may be helpful to complete the activities using both websites to compare their outputs.

Links
GitHub repository for the workshop: https://github.com/Vesoulis-Lab/fannp2026/
Epic Training: https://training.epic.com

Contact information
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Interactive Activity Instructions

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Activity 1 - LLM Practice
Log in into the ChatGPT and/or Claude websites, cut and paste these prompts

1. Help me understand the role of cerebral NIRS monitoring in managing neonatal HIE
2. Go to this article: https://pmc.ncbi.nlm.nih.gov/articles/PMC5457314/pdf/nihms853990.pdf and copy the full text of the article. Next go back to ChatGPT/Claude and type in "summarize this article in 3 sentences" and then paste the text of the article.
3. Make a diagram of how to manage a patent ductus arteriosus in premature NICU patients. *Try this in ChatGPT and Claude to see the difference in their outputs.*
4. Write a recommendation letter for a colleague who is applying to a DNP program. She is a friendly gal who loves to learn but has some issues with getting to work on time and prioritizing tasks. You want to communicate these concerns in an honest way without making her look bad at the same time.
5. Write a specific aims page in the NIH R01 style. It should be about an experiment melatonin protocol to be used for neuroprotection in a Vannucci rat model

Activity 2 – Research tools
1. Go to OpenEvidence (https://www.openevidence.com/) and ask the following question: "I have a 1-day old neonate with a hemoglobin of 5 without evidence of abruption. They are not tachycardic and have normal blood pressure, give me a differential diagnosis and next diagnostic steps."
2. Go to ChatGPT and ask the following: "Using deep research, help me to better understand the risk of cerebral palsy after intraventricular hemorrhage. Look at both low and high grade IVH."
3. Go to OpenEvidence and ask the following question: "Summarize how sedation is both good and bad for babies in the NICU."

Activity 3 – Epic Slicer Dicer

1. Identify episodes of hypoglycemia and hyperglycemia in your unit. Start with the "Patient" data model and select your NICU department. Link it to the "Lab Component Results" data model and select "GLUCOSE" as the lab test. Add slices to identify how many values were less than 45 and greater than 300.
2. Obtain a count of CDH admissions 2024-2025. Using the "Encounters" data model, identify the number of patients with a diagnosis of congenital diaphragmatic hernia (ICD-10 Q79.0) in the last 2 years.
3. Count how many times dexmedetomidine (precedex) was ordered this year. Start with "All Medication Administrations" model, search for "dexmedetomidine" under order medication and limit it to your NICU department. Under dates, select Jan 1 2025 for the start date and today for the end date.

Activity 4 - NeoMIND-AI Tools
1. Visit the Presentations website (https://neomindai.com/presentations-1) to see past webinars
2. Visit the Apps page (https://neomindai.com/apps) and go to the Exploratory Data Analysis Tool
3. We will perform analysis on two files. The first is purely numeric data, containing HR and SpO2 values. From the GitHub site (https://github.com/Vesoulis-Lab/fannp2026/) make sure you have downloaded the file "numeric_datasample.xlsx."
4. In the upload data file box, browse to the file on your computer and press "view summary." Basic statistical results appear in the Data Summary tab, the raw data elements can be viewed in table form under the Data Table tab, and a boxplot visualization can be seen under the Numeric Visuals tab.
5. In the second example, we will use a file of artificially generated clinical data which resembles something that would be collected in a typical NICU clinical research study.
6. First, press the refresh button on your browser to reload everything. Press browse to locate the file "categorical_datasample.xlsx" and upload it. Since this data file contains numerical and categorical variables, you will need to place a check in the box next to all the categorical variables (sex, multiple birth, maternal conditions, delivery method, respiratory support, complications, survived). In addition to the analysis tools covered in the last file, there are additional categorical options including Categorical Summary tab which provides frequency counts and the Categorical Visuals tab which provides visualizations.

Activity 5 - Practice Big Data Analytics in in R Studio (ADVANCED)
1. Start R studio on your computer
2. Open the file "R_example.Rmd" (downloaded from the "code and data" folder in the GitHub repository)
3. Ensure that the two underlying data files are in the same folder (df_long.rds and newTable.rds)
4. Press the "Knit" button (ball of yarn with needles icon)
5. Once it completes running, a new window will open. The produced document contains a complete walkthrough of the code and output from an analysis looking at longitudinal heart rate and SpO2 data in preterm infants.
6. If you encounter problems running the code in R studio, a premade output file can be accessed in the same folder (R_example.html) and can be opened in any web browser

Activity 6 - More practice with Big Data Analytics in Octave/MATLAB (VERY ADVANCED)
1. Ensure that you have downloaded the data and code for this exercise. This includes two scripts (data_intro.m and hrv_calc.m) and two datafiles (NICU_1007_vitals.mat and NICU_1095_vitals.mat). The two datafiles are provided as compressed ZIP files, please unzip them before you get started.

2. Start Octave/MATLAB or start MATLAB online
3. Open data_intro.m. This script can either be run all at once and you can review the output line by line. We suggest that you read through the script, cutting and pasting code blocks as you go. In this first script, you will learn how to load datasets, determine the statistical properties of a dataset, and generate visualization.
4. For the second part of the activity, open hrv_calc.m. This script provides a basic heart rate variability calculator. Again, we recommend cutting and pasting code blocks as you go through the script.

*** Please note that if you use MATLAB online, you will need to upload the datafiles before you can run the scripts. ***