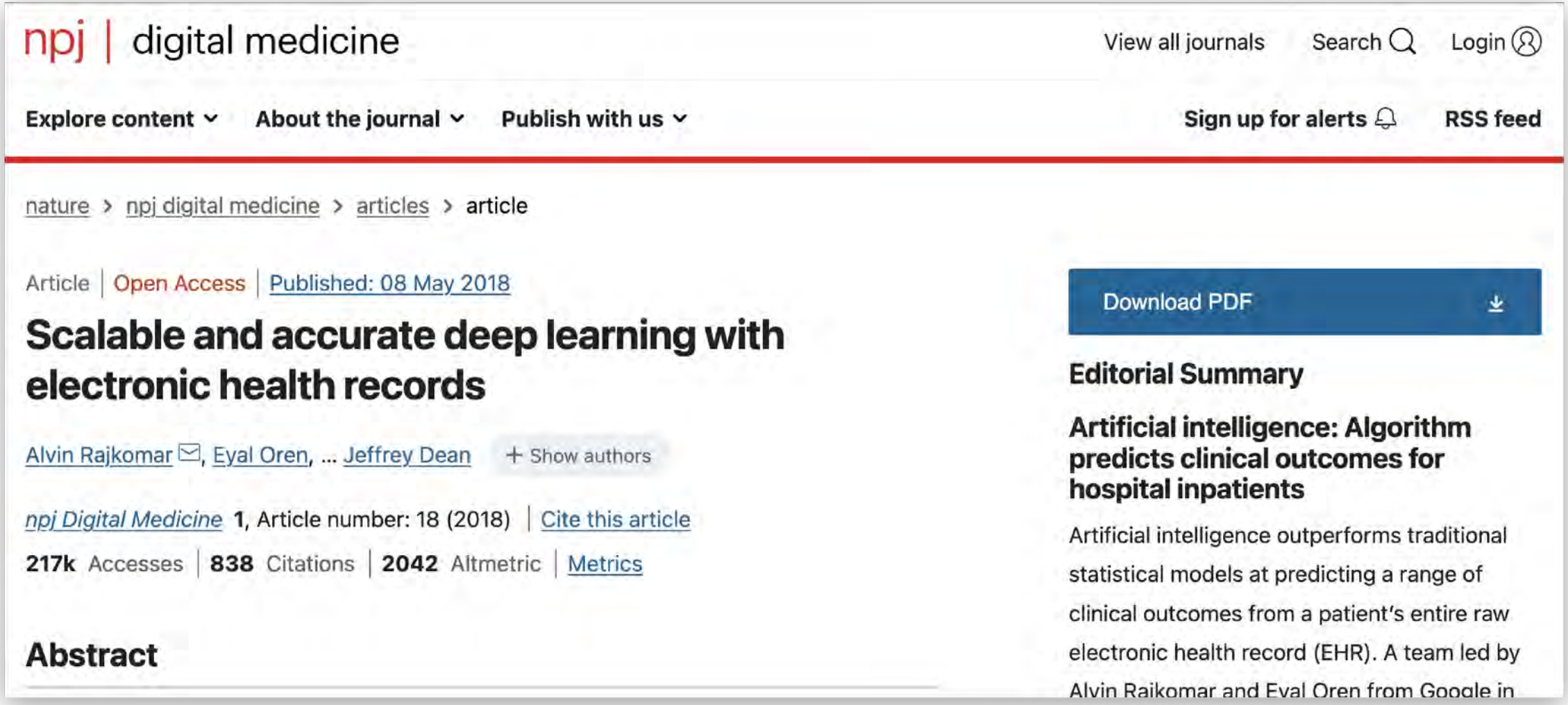
BST-209: Collaborative Data Science in Healthcare

Summer Program in Clinical Effectiveness:

31 July 2023

Become familiar with machine learning concepts



npj | digital medicine

View all journals Search Login

Explore content About the journal Publish with us Sign up for alerts RSS feed

nature > npj digital medicine > articles > article

Article | Open Access | Published: 08 May 2018

Scalable and accurate deep learning with electronic health records

Alvin Rajkomar, Eyal Oren, ... Jeffrey Dean + Show authors

npj Digital Medicine **1**, Article number: 18 (2018) | Cite this article

217k Accesses | **838** Citations | **2042** Altmetric | Metrics

Abstract

Download PDF

Editorial Summary

Artificial intelligence: Algorithm predicts clinical outcomes for hospital inpatients

Artificial intelligence outperforms traditional statistical models at predicting a range of clinical outcomes from a patient's entire raw electronic health record (EHR). A team led by Alvin Rajkomar and Eyal Oren from Google in

Get hands-on coding experience

```
---
title: "Predicting outcome of patients in the ICU"
output: pdf_document
date: "1/1/2023"
---

```{r load_data, include=FALSE}
sql_query <- "SELECT i.subject_id, i.hadm_id, i.los
              FROM `physionet-data.mimiciii_demo.icustays` i;"
data <- run_query(sql_query)
head(data)
```

This document shows how RMarkdown can be used to create a reproducible analysis using
MIMIC-III (version 1.4). Let's calculate the median length of stay in the ICU and
then include this value in our document.

```{r calculate_mean_los, include=FALSE}
avg_los <- median(data$los, na.rm=TRUE)
rounded_avg_los <- round(avg_los, digits = 2)
```

So the median length of stay in the ICU is `r avg_los` days. Rounded to two decimal
places, this is `r rounded_avg_los` days. We can plot the distribution of length of
```

Build collaborations

Photo: 49th Annual Conference of the Society of Critical Care Medicine (SCCM 2020)

Schedule

Overview

- First two weeks, focus on methods for learning from data
    - Responsible machine learning
    - Data wrangling
    - Building and evaluating models
    - Communication of results
- Final week of the course:
    - Explore bias in oxygen saturation measurements.
    - Plan and present a team project.

Week 1

	Workshop (1 - 2pm)	Talk (2 - 2.30pm)
Mon 31 Jul	Course introduction	Leo Celi (MIT)
Tue 1 Aug	Responsible ML	Vinith Suriyakumar (MIT)
Wed 2 Aug	Responsible ML	Ahmed Abdelfattah (Harvard)
Thu 3 Aug	Introduction to ML	Tristan Naumann (Microsoft)
Fri 4 Aug	Introduction to ML	Danielle Bitterman (Harvard)

Week 2

	Workshop (1 - 2pm)	Talk (2 - 2.30pm)
Mon 31 Jul	Introduction to ML	Fábio Duarte (MIT)
Tue 1 Aug	Tree models	Vesela Kovacheva (Harvard)
Wed 2 Aug	Tree models	Weiwei Pan (Harvard)
Thu 3 Aug	Process mining	Suzy McKinney (Harvard)
Fri 4 Aug	Generative AI	Eugenio Zuccarelli (CVS)

Week 3

	Workshop (1 - 2.30pm)
Mon 31 Jul	Project (pulse oximetry)
Tue 1 Aug	Project (pulse oximetry)
Wed 2 Aug	Project (pulse oximetry)
Thu 3 Aug	Prepare group presentations
Fri 4 Aug	Group presentations

Presentation (Fri 18 Aug)

- Propose a project
- 6 minute talk (group, slides)
  - Introduction
  - Goals
  - Data
  - Methods

Groups

Group 1

João Matos

Yusuke Takeda

Naira Link

Hui Miao

Group 2

Renata Proa

Chrystinne Fernandes

David Gritsch

Crystal McLellan

Group 3

Niklas Adams

Fredrik Willumsen Haug

Pui Ning Pauline Yeung

Asimina Lazaridou

Group 4

Lasse Hansen

Zara Sheikh

Hiten Naik

Kieun Seok

Group 5

Nikolaj Munch

Sarah Loh

Anvesh Narimiti

Heena Manglani

Sung Hae Chang

Group 6

Tristan Struja

Khushboo Teotia

Rachel Rosen

Ana Cecilia Farfan Ruiz

Hiroki Mizuno

Lisa Gudenkauf

Group 7

David Restrepo

Ohad Oren

Ardel Romero Pabon

Kevin An

Group 8

Eptehal Nashnoush

Krishnaveni Parvataneni

Christopher Callahan

Margaret Ong

Kimberly Mills

Group 9

Kevin Ma

Hugh Kim

Yung Lee

Christopher Dall

Group 10

Po-Chih Kuo

Chao-Ju (Luna) Chen

James Stone

Tina Shiang

Rodrigo Rosa Gameiro

Sotonye Imadojemu

Group 11

Jack Gallifant

Adrien Carrel

Zihan Quian

Hong Xiong

Heng Cai

Evaluation

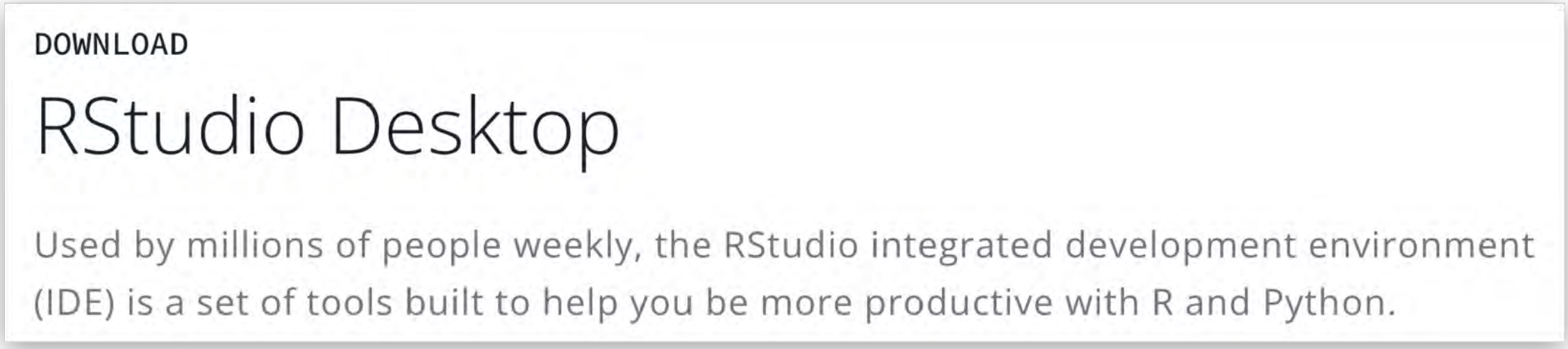
Final grades based on:

- Attendance and participation: 60%
- Group presentation 40%

Any questions?

Getting set up

RStudio



https://posit.co/download/rstudio-desktop/

Course materials

https://github.com/mit-lcp/bst209