Schuyler D. Smith, Ph.D.

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Education

Ph.D.   **Bioinformatics and Computational Biology**   2021
  Iowa State University, Ames, IA
  Characterization of environmental microbiomes impacted by Iowa agriculture.

M.S.   **Quantitative Genetics**   2015
  Texas A&M University, College Station, TX
  Molecular Characterization of the Texas Maize Breeding Program.

B.S.   **Genetics**   2012
  Iowa State University, Ames, IA

Experience

Senior Computational Scientist, Bioinformatics   2021 – *present*
  Agronomic and Environmental Sciences
  Nutrien Ag Solutions - Champaign, Illinois
  *Full-stack bioinformatician, in charge of building pipelines in NextFlow and setting
  up cloud-computing environments for AWS and GCP, developing custom software
  and packages for analyses, and analyses of microbiome data to present to
  stakeholders.*

Graduate Research Assistant - Ph.D.   2015 – 2016
  Potato Breeding and Genetics Laboratory
  University of Wisconsin - Madison - Madison, Wisconsin
  *Developed a pipeline for processing NGS sequencing data and SNP-calling for
  auto-tetraploid crops, performed GWAS, and investigated ML methods for
  imputation of auto-tetraploid genotypes.*

Biological Science Technician - Internship   2014
  Arid-Land Agricultural Research Center
  United States Department of Agriculture - Maricopa, Arizona
  *Evaluated high-throughput phenotyping platforms for crop traits such as canopy
  cover, plant height, and seed counting.*

Maize Breeding Intern   2012
  Huxley Research Station
  Monsanto Company - Huxley, Iowa

Maize Product Trait Development Intern – 6 month   2011
  Willmar Research Station
  DuPont Pioneer - Willmar, Minnesota

Undergraduate Research Assistant   2010 - 2011
  Soybean Genomics Laboratory - Graham Lab
  United States Department of Agriculture - Ames, Iowa

Applicable Skills

R	AWS / GCP / Slurm	Markdown
python	NextFlow / SnakeMake / AirFlow	HTML / CSS
C++	CI / CD (Git / Jenkins)	LaTeX
BASH	Docker / Singularity	Image J
SQL	Shiny / Dash / Power BI	Linux / Windows / MacOS

Software

phylosmith: R package for reproducible and efficient microbiome analysis with phyloseq-objects.

NextFlow Workflows: Nextflow Workflows I've built for various bioinformatics analyses.

smartchip_analyzer: C++ program for processing data from a SmartChip qPCR.

weather_api: python package with modules for accessing a weather-data API.

ssBLAST: R package wrapping functions written in C++ to parse BLAST outputs and manipulate corresponding FASTQ/FASTA files.

simple.dada: R package for streamlined implementation of the dada2 processing pipeline.

schuylR: R package of various functions that I often find useful.

linux_box_sync: BASH program to sync a local Box directory on a Linux machine to the cloud.

hpcc_R_setup: BASH program to setup R on the MSU-HPCC.

Selected Publications

Schuyler D. Smith, Choi, J., Howe, A. *Diversity of Antibiotic Resistance genes and Transfer Elements-Quantitative Monitoring (DARTE-QM): a method for sequencing microbiome functional profiles*. Communications Biology 2021.

Schuyler D. Smith, Colgan, P., Yang, F., Rieke, E.L., Soupir, M.L., Moorman, T.B., Allen, H.K., Howe, A. *Investigating the dispersal of antibiotic resistance associated genes from manure application to soil and drainage waters in simulated agricultural farmland systems*. 2019.

Schuyler D. Smith *phylosmith: an R-package for reproducible and efficient microbiome analysis with phyloseq-objects*. 2019.

Schuyler D. Smith, Heffner, E., Murray, S.C. *Molecular analysis of genetic diversity in a Texas maize breeding program*. 2015.

Workshops Taught

Data Carpentry: Genomics, Oklahoma State University, online	2021
Software Carpentry: Shell, Git, R for Reproducible Scientific Analysis, University of Idaho, online	2021
Data Carpentry: Ecology, Merck & Co., online	2020
Data Carpentry: Genomics, George Washington University, Washington, D.C.	2020
Data Carpentry: Ecology, Merck & Co., Upper Gwynedd, PA	2019
Girls in Science Initiaive, Science Center of Iowa, Des Moines, IA	2019
Introduction to Data Analysis, Iowa State University, Ames, IA	2017 & 2018
Iowa State BCB Data Analysis Language Workshops Introduction to Unix	2017 & 2018
Iowa State BCB Data Analysis Language Workshops Introduction to Python	2017
Explorations in Data Analyses for Metagenomic Advances in Microbial Ecology	2017 & 2018