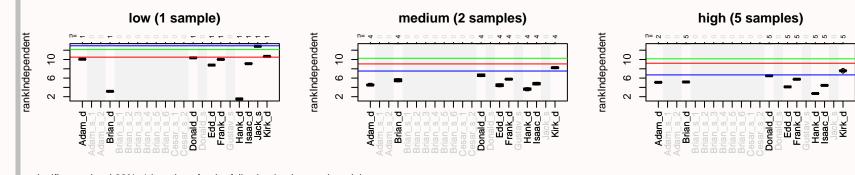
across all 3 datasets

Toy competition, metric: Unifrac



significance level 90%, 1 iterations for the following background models: true number of species, drawn from all 328832 bacterial species in NCBI, abundances from log-normal(mu=1.0,sigma=2.0) true number of species, drawn from all ever prediced species (6848), abundances from log-normal(mu=1.0,sigma=2.0) true strains, true but shuffled abundances

Toy competition, metric: L1norm across all 3 datasets low (1 sample) medium (2 samples) high (5 samples) 1.5 5. across all 8 ranks across all 8 ranks across all 8 ranks across all 8 ranks 1.0 1.0 1.0 0.5 0.5 0.5 0.5 Donald d | Donald S | Donald d - Donald d - Donald d - Edd d - Frank d - Hank d Donald d | Brian_d -Cesar s 2 L Donald d L Donald s L Edd d L Frank d L Hank d L Isaac d L Adam_d _ Adam_d _ 9 - 9 9 - 9 9 - 9 0.08 0.08 0.08 0.08 90.0 90.0 90.0 0.00 superkingdom superkingdom superkingdom superkingdom 0.04 0.04 0.04 0.04 Ī 0.02 0.02 0.02 0.02 ₽ 0.00 0.00 0.00 0.00 Hank_d Isaac_d Jack_s Kirk_d Hank d Donald_d — Frank_d — Hank day Hank_d – Isaac_d – Frank_d Frank_d Donald_d -Brian_d -Donald_d -Brian d Brian Brian 1.5 phylum phylum phylum phylum 1.0 1.0 1.0 1.0 0.5 0.0 Hank d Edd d -Frank_d -Brian_d -Kirk d Kirk d Donald_d -Edd_d -Frank_d -Donald_d Frank Hank d Edd d Frank d Brian_d Hank_d Isaac_d Donald_d Brian_d Donald_d Adam_d Adam_d Brian 2.0 2.0 2.0 2.0 1.5 1.5 1.5 1.5 class class class class 0.1 0.1 0.1 1.0 Q O ₽ ₿ Frank_d | Donald_d -Frank_d -Frank_d -Brian_d -Brian_d -Brian_d -Brian d Donald_d · Donald_d Adam_d Fank Donald order 1.0 1.0 1.0 1.0 Ē Frank d Brian_d Edd_d -Frank_d -Hank d-Isaac_d-Jack_s-Kirk_d-Donald_d -Frank d Frank Brian_d Donald_d 1.5 1.5 1.5 7 1.0 1.0 1.0 1.0 Hank d I Prank d | Hank d | Ha Edd d -Frank d -Frank d Frank d Hank d Frank d Donald_d Donald_d 1.5 1.5 1.5 ₽ 1.5 genus 1.0 1.0 1.0 1.0 Donald_d Donald_d Frank_d Hank_d Sack_s Cack_s Donald d | Donald s | Edd d | Oesar s 2 L Donald d L Donald s L Edd d L Adam_d — dam_s 2 — dam_s 2 — Brian_d — Cesar s 2 L Donald d L Donald s L Edd d L 2.0 1.5 1.5 1.5 species 1.0 1.0 0.1 1.0 В 0.5 0.5 0.5 Frank d Fank d Donald_d · Frank d Donald_d · Fank d Brian d Brian_d Donald_d Donald_d .8 1.6 strain 1.2 1.2 1.2 1.2 Ponald d

Edd d

Frank d

Hank d

Isaac d

Sack s

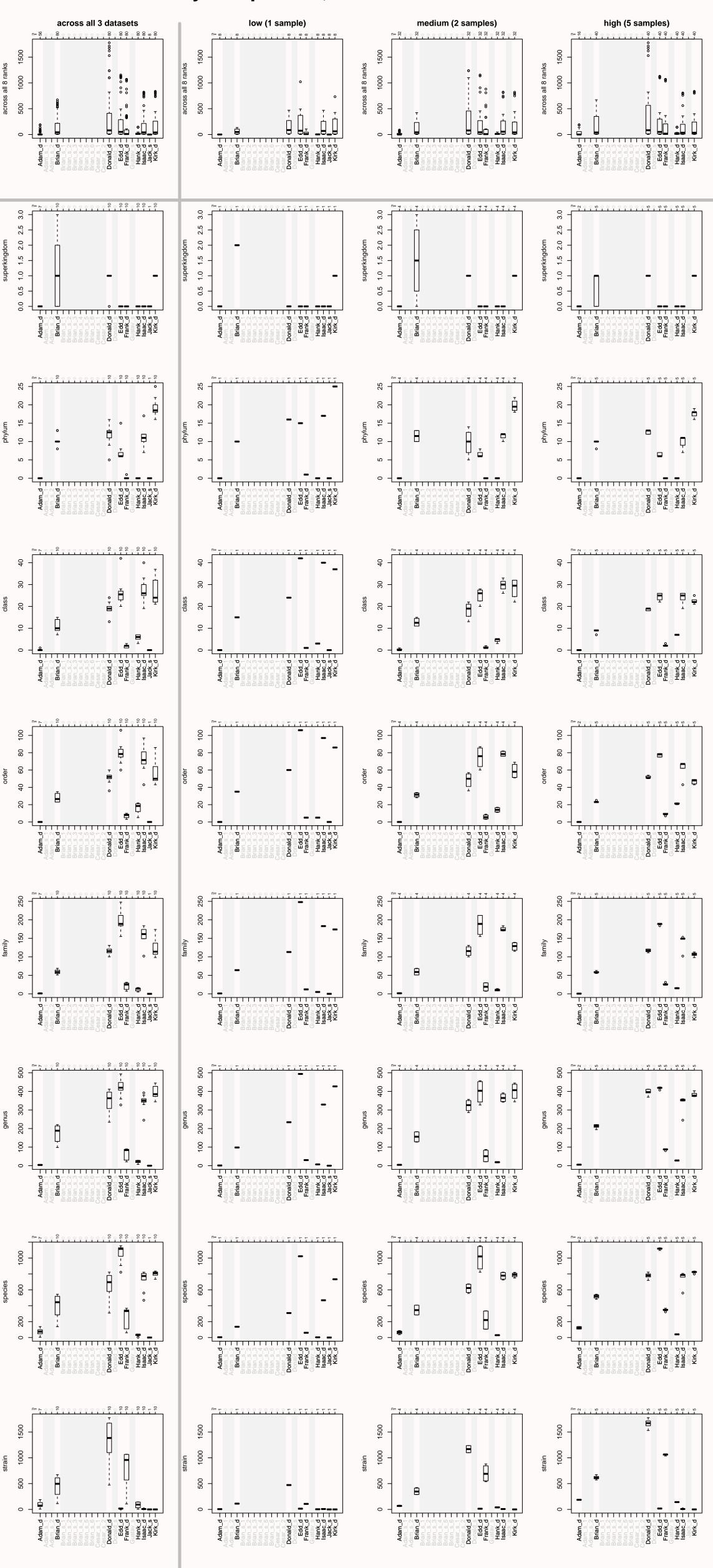
Ack s Donald d – Edd d – Frank d – am s 1 | Jam s 2 | Brian d | Brian_d -Brian d -Adam_d Adam_d significance level 90%, 1 iterations for the following background models: true number of species, drawn from all 328832 bacterial species in NCBI, abundances from log-normal(mu=1.0,sigma=2.0) true number of species, drawn from all ever prediced species (6848), abundances from log-normal(mu=1.0,sigma=2.0)

true strains, true but shuffled abundances

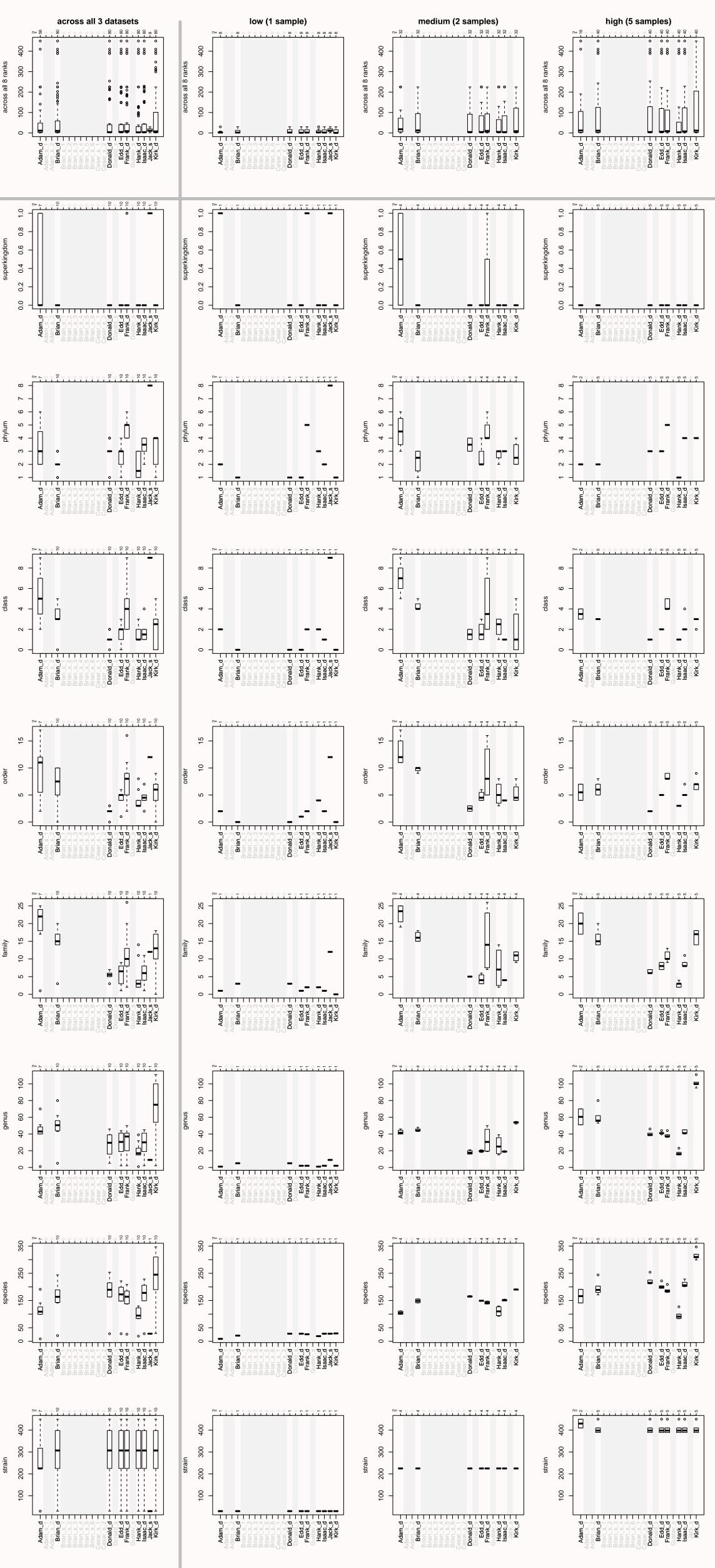
Toy competition, metric: Sensitivity low (1 sample) across all 3 datasets medium (2 samples) high (5 samples) 0.8 0.8 0.8 0.8 across all 8 ranks across all 8 ranks across all 8 ranks across all 8 ranks 9.0 9.0 0.4 0.4 9.0 0.2 0.2 0.2 0.2 Adam_d _ Hank d I Saac d I Jack s I Kirk d I Donald d I Adam_d — Hank_d -Frank d I Donald_d -0.9 6.0 0.9 6.0 superkingdom superkingdom superkingdom superkingdom 0.8 0.8 0.8 0.8 0.7 0.7 0.7 0.7 9.0 9.0 9.0 9.0 0.5 0.5 0.5 Edd_d | Frank_d Frank Brian d Brian Fank dd. d. fank d. Brian d Brian_d Donald_d Donald_d Donald_d Donald_d 0.8 0.8 9.0 9.0 9.0 9.0 phylum phylum phylum phylum 9.0 0.4 0.4 0.4 Edd_d -Frank_d -Adam_d Frank d Hank d Isaac d Jack s Kirk d Kirk d Kirk Frank_d Edd_d Frank_d Hank_d Isaac_d Hank_d Isaac_d Donald_d Donald_d Donald_d Brian_d Donald_d ļ 0.8 0.8 0.8 9.0 9.0 9.0 9.0 class class class 0.4 0.4 0.4 Frank_d -Frank_d-Adam_d Donald d Brian d Frank_d-Donald_d Brian_d Adam_d Fank Donald Donald Brian Brian 9.0 order 9.0 9.0 0.4 0.4 0.4 0.4 Hank d Frank_d Donald_d -Frank_d -Brian_d -Brian d Frank d Hank d-Isaac d-Brian_d Frank d Hank_d -lsaac_d -Donald_d Donald_d Donald_d Ē. family 9.0 family 9.0 9.0 9.0 9.4 0.4 0.4 Donald do Donald d | Edd Hank d Kirk_d -Frank_d Donald_d -Donald_d -Kirk d Frank_d-Hank_d -Adam_d Donald_d Donald_d 9.0 9.0 genus 0.4 9.4 Donald d | Consider of the consideration of the consider Donald d L Donald d L Edd d L Frank d L Gustav S Hank d L Saac d L Saac d L Donald d | Donald s | Donald d I Kirk d Hank d-Isaac d-Jack s-Kirk d-₽ 0.7 0.7 0.7 0.5 0.5 0.5 0.5 species species species Donald_d Frank_d | Donald_d | Edd_d | Frank_d | Fact d Frank Brian_d -Donald_d -Brian_d -Donald_d · Adam_d Donald_d -0.5 -0.5 -0.5 -1.0 -1.0 -1.0 -1.0 Frank_d Frank_d Hank_d Isaac_d Jack_s Donald C Edd d Frank d I Gustav S I Hank d I Isaac d I dam_s_2 -Brian_d -Adam s 2 -Brian d -Adam_d

Toy competition, metric: Precision across all 3 datasets low (1 sample) medium (2 samples) high (5 samples) 1.0 ₽; \Box ₽ ₽ Ē 0.5 0.5 0.5 0.5 across all 8 ranks across all 8 ranks across all 8 ranks across all 8 ranks ₫. 0.0 0.0 0.0 0.0 -0.5 -0.5 -0.5 -1.0 -1.0 -1.0 -1.0 Adam_d -Hank d Hank d Isaac d Lack s L Donald_d -Frank d Adam_d Frank d Hank_d Isaac_d Fank d Donald_d Donald_d Frank 0.0 0.8 0.8 0.8 0.8 superkingdom superkingdom superkingdom superkingdom 0.6 0.7 0.7 0.7 0.7 9.0 9.0 9.0 0.5 0.5 0.5 0.5 0.4 Hank day Hank d Isaac d Jack s Kirk d Frank Frank_d Hank_d | |saac_d | Frank Brian_d -Donald_d -Donald_d -Frank Hank d Brian_d Brian d Brian_d Donald d Donald_d 0.8 0.8 0.8 0.8 Ė phylum phylum phylum phylum 9.0 9.0 9.0 9.0 0.4 Edd d -Frank d -Donald_d -Edd_d -Frank_d -Adam_d -Frank d Frank d Kirk Kirk Brian_d Hank_d Isaac_d Hank_d Isaac_d Donald_d Donald_d Brian_d Donald_d 0.8 0.8 0.8 0.8 class class class ₫ 9.0 9.0 9.0 9.0 Ī Ē 0.4 0.4 0.4 0.4 0.2 Frank_d Frank_d Brian_d -Brian_d -Donald_d -Frank d Frank_d-Hank_d -Isaac_d -Adam_d Donald_d Donald_d Adam_d Donald Brian Brian ₽ 0.8 0.8 0.8 ₿ 9.0 9.0 Ī Ţ 0.4 9.0 0.4 0.4 0.2 0.2 0.2 Donald a Line of the control of the Frank d | Lank d | La Brian d Brian d Frank d Hank d-Isaac d-Brian_d Frank d Hank_d -lsaac_d -Donald_d Donald_d Donald_d Ē 9.0 family Ī 0.4 9.0 0.4 Ponald d | Donald d -Edd d -Frank d -Adam_d · Hank d -Isaac d -Kirk d Donald_d Donald_d 0.8 0.8 0.8 0.8 genus genus 0.4 9.4 0.4 ₿ Adam_d — dam_s — dam_s 2 — Brian_d — Donald d Frank d Frank d Hank d Sack s Kirk d Adam_d — dam_s_l — dam_s_l — Brian_d — Adam_d — dam_s_1 — dam_s_2 — Brian_d — Brian_d — Donald d | Donald d | Edd d | Frank d | Donald d | Donald s | Adam_d d dam_s 1 dam_s 1 dam_s 2 dam_s Kirk d Hank_d -Hank d Ē 0.8 0.8 0.8 9.0 9.0 9.0 9.0 species 0.4 0.4 0.4 0.2 0.2 0.2 Donald d | Donald d | Donald d | Donald s | Donald d Donald d Frank d Frank d dam_s_2 — Brian_d — Frank_d I Brian_d -Donald_d · Donald_d · Brian_d Adam_d strain Donald d Frank d Hank d Isaac d Sirk s Frank d L Brian_d — Adam_d --Adam_s_1 --Adam_s_2 --Brian_d --Adam_d

Toy competition, metric: False Positives



Toy competition, metric: False Negatives



Toy competition, metric: True Positives across all 3 datasets low (1 sample) medium (2 samples) high (5 samples) 250 250 250 200 200 200 200 across all 8 ranks across all 8 ranks across all 8 ranks across all 8 ranks 150 150 150 150 100 100 100 100 20 20 20 20 Donald d | L Donald d - L Hank d Adam_d _ Adam_d -Donald d Frank d I Hank d Donald_d Fank 6. 1.8 1.8 1.8 superkingdom superkingdom superkingdom superkingdom 1.6 1.6 1.6 1.6 4. 4. 1.2 1.2 1.2 1.2 1.0 1.0 1.0 Frank_d — Frank_d Fard d Hank_d | |saac_d | Frank Donald_d -Brian Brian Hank d Brian_d Donald d Donald_d Donald_d 15 15 15 15 Ţ -□ phylum phylum phylum phylum 10 10 10 10 2 2 2 2 Edd d -Frank d -Edd d -Frank d -Adam_d -Donald_d Frank d Donald_d Hank d Isaac d Jack s Frank d Hank d Kirk d Kirk Hank_d Isaac_d Donald_d Donald_d Adam_d 30 30 25 25 25 20 20 20 20 class class class 15 15 15 15 10 10 10 10 2 Donald_d -Frank_d -Frank_d-Adam_d -Frank_d-Brian d Adam_d Hank_d -Isaac_d -Donald_d · Donald Fark Donald Brian Brian 9 9 9 9 20 20 20 40 40 40 order order 30 30 30 30 20 20 20 20 10 10 10 10 Donald_d — Hank d Frank_d Frank_d Hank_d -Isaac_d -Brian d Frank d Hank d-Isaac d-Jack s-Kirk d-Brian d Frank_d Brian d Brian_d -Hank_d -lsaac_d -Adam_d Donald_d Donald_d Donald_d Adam_d 100 100 100 80 80 80 80 Ď. Ę family family family family 9 9 9 9 40 40 40 40 20 20 20 20 Ponald d - Donald d - Frank d Isaac S Isaac Isaac Isaac S Is Ponald d | Edd d | Hank d | Hank d | Kirk d | Hank d | Ha Ponald d | Edd_d | Hank_d | Hank_d | Kirk_d | Kirk_d | Kirk_d | Kirk_d | Kirk_d | Kirk_d | Hank_d | Kirk_d | Hank_d | Kirk_d | Hank_d | Kirk_d | Hank_d | Ha Donald_d -Adam_d -Donald_d -Donald_d Donald_d Adam_d 150 150 150 100 100 100 100 genus genus genus Ţ-Ē 20 20 20 20 Donald d | Adam_d — dam_s 1 — dam_s 2 — Brian_d — Brian_d — I Donald do Adam_d — dam_s_1 — dam_s_1 — Brian_d — Donald d | Donald S | Kirk d 250 250 200 200 200 150 150 150 150 species species species 100 100 100 100 50 20 50 Donald d | Donald s | Donald d | 1 Frank_d | Adam_d -Frank d Brian_d -Brian_d -Brian_d -Hank_d -Donald_d · Donald_d · Adam_d -0.5 -0.5 -0.5 -0.5 -1.0 -1.0 -1.0 -1.0 Frank d Hank d Isaac d Kirk d Brian_d -Edd d Lank d Lan Ponald d | Donald d | Edd d | Frank d | Frank d | Hank d | Isaac d | Brian_d -Edd d Lank d L Hank d L Saac d L Brian_d -Donald d -Brian_d -Donald_d -Donald_d -Adam_d Adam_d

number of taxonomic classes in gold standard profile(s)