



Maxeler Technologies

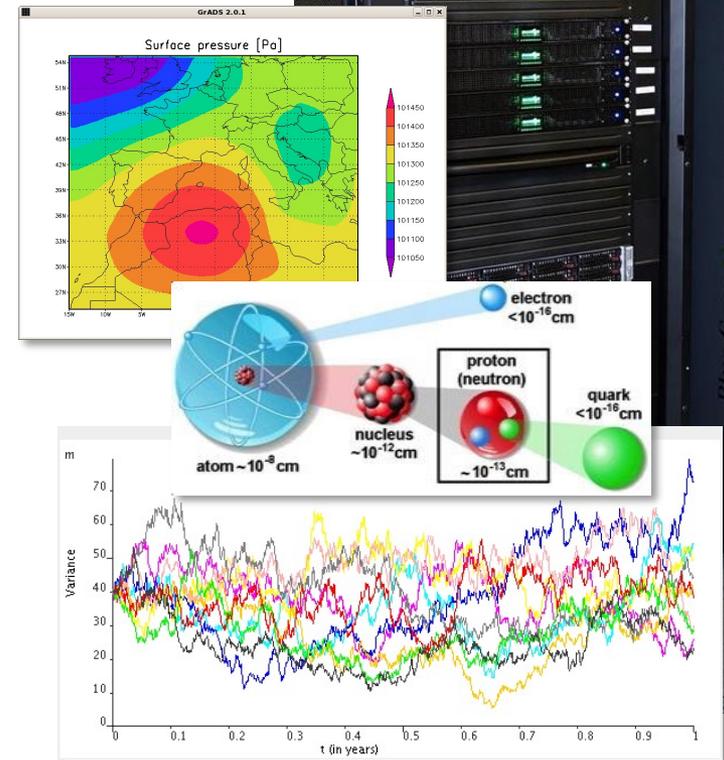
Leading Digital Transformation

Tobias Becker

18 May 2021

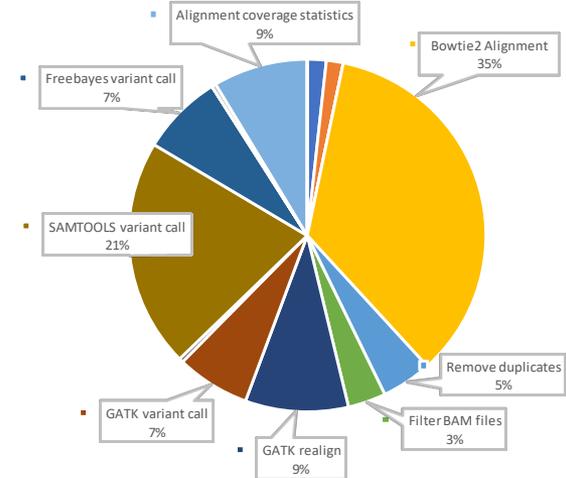
About Maxeler Technologies

- High-performance computing
 - Scientific computing, physics, chemistry, finance, genomics, AI
- Smart & efficient processing
 - Specialised software, digital transformation
- Cyber-security
 - Hardware firewall, encryption
- Edge & IoT
 - Smart processing at the edge
- Cloud technology
- Strong track record on research and innovation



Accelerated Genomics Processing

- Fast & efficient processing for alignment, variant calling
 - Compute intensive workloads
 - Dedicated hardware acceleration
 - Smith Waterman, Bowtie2, Myers, GEMTools
- Faster & lower power
- More cost efficient



Smith Waterman Demo - Maxeler Technologies

Alignment Type: _____

Query:

Number of queries: 174
Min length: 1280
Max length: 1280

Database:

Number of sequences: 532224
Number of residues: 188726448

Scoring matrix: BLOSUM62

Open Gap Penalty:

Query: UniRef50_F212I7 Histone-lysine N-methyl transferase na8 Tax=E (1280)

Best scores:

Accession	Protein Name	Score	Length	SW
sp O1DR06 SET1_L_COCIN	Histone-lysine N-methyl transferase, H3	(1271)	4077	
sp O2UMH3 SET1_ASPOR	Histone-lysine N-methyl transferase, H3	(1229)	3849	
sp O4WNH8 SET1_ASPFU	Histone-lysine N-methyl transferase, H3	(1241)	3818	
sp O5B0V5 SET1_LHANI	Histone-lysine N-methyl transferase, H3	(1220)	3683	
sp O8X0C9 SET1_NEUCR	Histone-lysine N-methyl transferase, H3	(1313)	2299	
sp O4T5K3 SET1_GIQEE	Histone-lysine N-methyl transferase, H3	(1252)	2150	
sp O2GWF3 SET1_CHAGB	Histone-lysine N-methyl transferase, H3	(1076)	2089	
sp O6BKL7 SET1_DEBHA	Histone-lysine N-methyl transferase, H3	(1088)	985	
sp O6CEK8 SET1_YARLI	Histone-lysine N-methyl transferase, H3	(1170)	938	
sp O5ABG1 SET1_CANAL	Histone-lysine N-methyl transferase, H3	(1040)	895	

Best alignment:

```

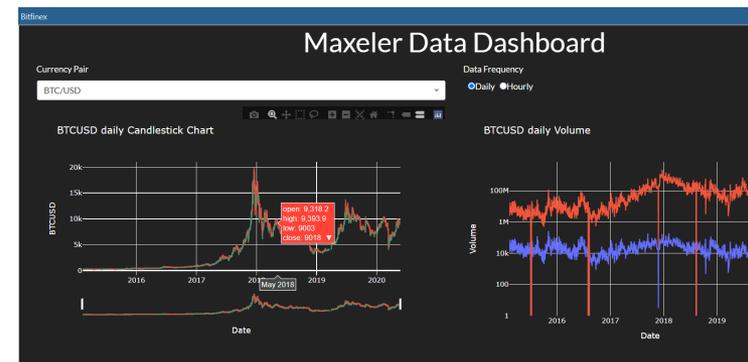
MSRAAGFADFFPTAPSYLQKKSLSAADDIPKQKLRHDDSSNPARTAAAVITGVGVVQAEEGASDNNISGV
MSRAAGFADFFPTAPSYLQKKSLSAADDI-HAA--NT--KRAADLNLGLSS-|-----DILK-LGVG---LSAD-
HININNNNNNNSSHNINSNIFDESAGAVRQVWELTDFDINGVSSSTSGSS-VFSASILRQPLTTSMLTH
-IPVAYGE-R--EAE-|-----L-L--L-L-GLTH---E-IT---SSSSLSTGGGFSASA-R-DAVAKVIGTSS
PHALPLTINTDSSP-DLAEEDLRNIDNTQPLFVGVCSIRYDSDPFRGGGPLLADAA-RRAYLECKEQRIGVRI
C-ALPLTINTDSSP-DLAEEDLRNIDNTQPLFVGVCSIRYDSDPFRGGGPEVITLPLHTRPRVDAFPAWSEVKGKILTYDQ
LERK-R-LTEKRRKQVVEYDITTED-EARRAPRIATANTRGA-GQKTKYRPAAYILRPPVDPATVSGPQPPTQIVY
DQRP-R-SIAKRRQKQETLQVQVQVDFR-DPFAAIANTRGA-GQKTKYRPAAYILRPPVDPATVSGPQPPTQIVY
TQYPLTLPLPISALPSSFGDAEDLRNIDNTQPLFVGVCSIRYDSDPFRGGGPLLADAA-RRAYLECKEQRIGVRI
TQYPLTLPLPISALPSSFGDCEINRITDQVIGYPLFVGVCSIRYDSDPFRGGGPEVITLPLHTRPRVDAFPAWSEVKGKILTYDQ
QVSLDRQVNSLQVARIQSDR-R-----DIP-PLINE-E-EN-----E-E-ED--NLPFP-TAPKGS-RK---RNM
RVELDRQVNSLQVARIQSDR-R-----DIP-PLINE-E-EN-----E-E-ED--NLPFP-TAPKGS-RK---RNM
LREPRPNTNNEPRLTEETPTLDLQKRPYETLAHQVPLSTLPHLERLKLQVWKAARQKTOYITFENSRRL
LRDQPR-R-LRISVPSRTEETPTLDLQKRPYETLAHQVPLSTLPHLERLKLQVWKAARQKTOYITFENSRRL
    
```

Performance: 812.0759 GCUPS

Stopping computation - please wait...

M-Space Collaboration Platform

- Cross-disciplinary collaboration and data analysis platform
 - Integrate data & code with collaboration and communication tools
- Powerful dashboarding tools
- Build workflows without coding skills
- Ensure data security and custody, Cloud and on-premise
- Ensure regulatory compliance (e.g. GDPR)
- Simple access through web browser



Predictive Medicine for Personalised Treatment

- Predict which drug will work best
- Personalise medication based on current disease, history, drug interaction, ect
- Provide decision support for clinician
- Based on explainable AI
 - How decision was reached can be explained to stakeholder and traced back to data.
- Integrated into M-Space

GU

Current Visit

Date Patient Graph

Type current date
08/04/2005

Diagnostic

Select disease

- × Bacterial pneumonia unspecified (482.9) ×
- × Simple chronic bronchitis (491.0) ×

Prescription

Select prescription

- × Opium derivatives and expectorants ×
- × Theophylline ×

Prediction

Summary

- Interest in Lot 3 & 4
- We have:
 - Fast & efficient sequencing tools
 - Explainable AI for personalized medicine
 - A secure collaboration platform that supports data analysis, dashboard, simple workflows
- We need partners for:
 - Analysis of sequencing data
 - Training data
 - Report generation
- Contact: Tobias Becker, tbecker@maxeler.com

Maxeler University Program: Research at over 150 Universities Worldwide

