



CENTRAL FORENSIC SCIENCE LABORATORY

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No.CFSL(C)/DNA mixer interp software/ EOI/2023/ 5383

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Expression of Interest (EOI)

Subject: Finalization of specifications of DNA Mixer Analysis software & hardware

Central Forensic Science Laboratory (CFSL) Chandigarh under Directorate of Forensic Science Services (DFSS), Ministry of Home Affairs, Government of India, intends to procure DNA Mixer Analysis software along with hardware for Advanced DNA Centre at CFSL Chandigarh. Accordingly broad based specifications of DNA Mixer Analysis software along with hardware are uploaded for inviting expression of interest from the prospective vendors. The comments may be sent to the office latest by 31th of September, 2023.

S/LM
15/9/23
Director

CFSL Chandigarh

Draft Technical Specifications of DNA Mixture Analysis Software

General outlines:

- Software should be capable of DNA Mixture Analysis along with DNA Database and Matching.
- Software should be capable to analyze unlimited number of mixture DNA profiles.
- System should accommodate unlimited number of DNA profiles on the DNA Database.
- Software should allow unlimited number of DNA profile searching and matching.
- The license should be perpetual in nature (No license renewal is required), firm should provide minimum 10 user access along with software.
- Software should accommodate unlimited number of DNA STR markers including Autosomal and sex chromosome markers.
- Software should be able to analyze the Y-STR DNA profiles.
- Firm should provide free of cost life time software up-gradation.
- Software should be able to accept the STR DNA profiles recovered from all commercially available forensically validated HID kits.
- Software and database should be highly secured in order to maintain data confidentiality, integrity, and to prevent unauthorized access.

Software Details:

1. Software should be able to identify 6-10 unknown contributors from mixtures STR profiles.
 2. Software should accept the different file formats directly recovered from the commercially available genetic sequencers.
 3. Software should allow analysis of a batch samples and/or complex mixtures and analysis interactions on groups of multi-selected peaks and/or samples simultaneously.
 4. Software should quantitatively describe DNA data using validated and forensically acceptable mathematical modeling.
 5. Software should visually explain its computer reasoning to an analyst via a graphical user interface.
 6. Software should compute and report a likelihood ratio as a match information statistic for any data.
 7. Software should summarize DNA identification data in an accurate genotype probability distribution and able to generate DNA profiles of the individual contributors.
 8. Software should be accountable for degraded DNA mixtures, allele drop out, stutters, pul-ups, and other artifacts through computer modeling.
 9. Software should report mixture weights of DNA contributors and their statistical certainty.
 10. Software should provide multiple users with a central database of information-rich genotype probabilities.
 11. Software should solve kinship identity problems using genotype probability methods.
- 17

12. Software should illuminate model amplification artifacts, such as stutter and relative amplification.
13. Software should calculate error rates that consider all genotype possibilities.
14. Software should enable scientific numerical reporting of all match statistics, no matter how low.
15. Software should infer objective genotypes without having a known comparison reference.
16. Software should extract more accurate DNA identification information than human review.
17. Software should offer built-in validation mechanisms for ascertaining efficacy and reproducibility.
18. Software should provide automated background computing for continuous processing of DNA evidence.
19. Software should deploy integrated quality assurance from DNA sequencer file through DNA profile.
20. Software should support batch workflow for simultaneous setup of multiple DNA questions.
21. Software should combine independent DNA evidence for more accurate genotype results.
22. Software should solve sexual assault, volume crime, homicide, mass disaster and paternity problems.
23. Software should show original quantitative data to a user alongside the computed results.
24. Software should exploit stochastic effects for better DNA identification using probability models.
25. Software should separate mixture data into contributor genotypes for simpler characterization.
26. Software should provide statistical support for both inclusionary and exclusionary match results.
27. Software should input all the data (loci and peaks) for more complete and objective answers.
28. Software should be capable of analyzing mixture DNA profile and providing results in the form of report, which may be acceptable in court of law. It should be able to interpretate questions, and review the answers.
29. Software and DNA database should have open option for retrieving STR profile data from other Forensic Science Laboratories for sharing of DNA STR profiles and related information for DNA Database purpose.

Server & Hardware Details:

1. Supercomputers should be based on High performance computing (HPC) architecture having the ability to process data and perform complex calculations at high speeds. The supercomputers can be expanded to contain thousands of compute nodes that work together to complete one or more tasks.
2. The system should be able to parallel processing to complete tasks faster.

3. The server Supercomputers should make use of the Linux OS and its derivative variants.
4. Supercomputer should have 16-core 2.4 GHz Server option or better
5. Server Type: Rack Mount
6. Socket: 2-socket 2U Rack Server or better
7. CPU: 2x Intel Xeon 8 Core 2.4 GHz processor (or equivalent)
8. Cores: 16 cores, 32 threads
9. RAM:24 slots, 64 GB - 4 x 16GB TruDDR4 3200 MHz (2Rx4 1.2V) RDIMM (RAM expandable upto 1TB RAM)
10. Hard Drive: 3.6 TB - 3 x 3.5" 1.2 TB - 7.2K SAS 12Gb Hot Swap 512e HDD/ 12Gbps 512n 2.5in Hot-plug (or equivalent).
11. A physical independent server should be installed at onsite.
12. Software should be USB dongle based.

Other Specifications Includes:

1. 2U 3.5" Chassis with 8 or 12 Bays v2
2. RAID/Internal Storage Controllers: RAID 9350-8i 2GB Flash PCIe 12Gb Adapter
3. 2U 3x3.5" SAS/SATA Backplane
4. Broadcom 5719 1GbE RJ45 4-port OCP Ethernet Adapter
5. 2U PCIe Gen4 x16/x16 Slot 1&2 Riser 1 or 2
6. 2 x 1100W (230Vac/115Vac) Platinum Hot Swap Power Supply
7. 2 x 2.8m, 13A/100-250V, C13 to C14 Jumper Cord
8. 6 x 2U Performance Fan
9. Toolless Slide Rail Kit v2
10. Feature Enable TPM on MB
11. UEFI Operating Modes Support
12. Also, Keep Your Hard Drive Option Included

Warranty Details:

- ✓ Warranty should be applicable only from the date of successful installation and satisfactory training at user end.
- ✓ Firm should provide quarterly preventive maintenance support apart from emergency breakdown or as when required at onsite.

Technical support:

- ✓ Firm should provide on-site technical support of a specialist technical person who can analyze and interpretate the data and troubleshoot capacity for minimum one year without any addition charges.