

SOFTWARE REVIEW

Of fine pedigree

Cyrillic, version 2.1. Platform: PC, Windows 3.1, 4 Mb RAM [Mac: Designed for Windows but can be used on PowerMac running SoftWindows (see <http://www.insignia.com/SoftWindows>)]

Cherwell Scientific, Magdalen Centre, Oxford Science Park, Oxford OX4 4GA, UK (<http://www.cherwell.com>).
India (authorized distributor): KEMS Software, 725 10th Main, 4th Block, Jayanagar, Bangalore 560 011 (e-mail: kems@bgl.vsnl.net.in). Price in India Rs 44,000.

Reviewed by N. V. JOSHI*

A typical example of the legendary British (at least of yesteryears) penchant for understating accomplishments, Cyrillic goes far beyond mere pedigree drawing. It is a very powerful tool for organizing and managing complex genetic information for a large family tree, in a convenient, user-friendly manner.

Study of genetic disorders (which naturally involves pedigree analysis) is one of the most active and important areas of contemporary research in genetics today. An additional impetus to such investigations has been provided by the discoveries revealing genetic predisposition as an important component of susceptibility of individuals to non-genetic diseases as well. However, most such links between disease susceptibility and genetic background are subtle and weak, and are often rather difficult to detect owing to the large number of masking and confounding factors. Data from a large number of genetically related individuals are essential for such studies. The recent advances in molecular biology have revolutionized the techniques for rapidly screening a large number of individuals for presence of specific genetic markers. These relatively inexpensive methods generate large volumes of data, which then need to be subjected to long and tedious analysis. In many situations, a brute-force computation is neither possible nor appropriate for detecting patterns in such complex data sets, and a careful scrutiny by experienced practitioners is necessary to 'make sense' of the information.

Drawing pedigrees is one of the best methods (and often the only one) for presenting such genetic information. This is not very difficult if all you have to handle is a family tree spanning a few generations, a few genotypes/traits, and maybe several dozen individuals. However, even in such a relatively simple situation, modifying or updating information about the tree is at best cumbersome and time-consuming;

a rapid display of several versions of a tree is simply not possible. This is exactly where Cyrillic steps in. For starters, it can handle up to 10,000 individuals, and up to 250 markers per chromosome at a time, and can show you up to nine family trees simultaneously. Add to it the cut-and-paste editing facility for transferring information between family trees, provision to present details at various levels, and excellent colour-coding and printing options, and you get a glimpse of the power of Cyrillic.

Traditionally, use of computers and software has been mainly for numerical computations—either involved calculations, or analysis of large data sets. The last one and a half decade has brought graphics and database management to the fore. The current buzzword is visualization, and that is what Cyrillic is about. In fact, one can imagine it being advertised as 'the BEST multidimensional visualization software' in screaming, multicolour headlines had it been developed across the Atlantic.

Now to the details of the product itself, though it is a little odd to review in 1998 a product developed for Windows 3.1, and distributed on a single 1.44-Mb floppy diskette (and a non-write-protected one at that)! However, in terms of ease of use and power, Cyrillic (version 2.1) is as good as (if not better than) anything I have come across. Installation is extremely straightforward, and over in a matter of minutes. It takes only about 4Mb of disk space (spread over more than 45 different directories, however), and loads very fast (on a 200-MHz Pentium with 32 Mb RAM). The software comes with a neatly spiral-bound, beautifully printed manual, which is very user friendly, and by scanning the first few pages one is able to begin using the software in virtually no time. The accompanying quick-reference card is also a thoughtful and useful addition.

Bundled along with the software are some examples (including one of European royalty, with the curious phrase 'intellectual disability' thrown in as a comment), very useful online help, and, most importantly, four tutorial files. With

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their help, within half an hour or less, anyone would be confident enough of undertaking the task of drawing even the most complex genealogies. The procedures for creating new family trees and then modifying or editing them are very intuitive. Almost anything can be done just with a few clicks of the mouse (yet another instance where mouse-based systems have been of great help to geneticists!)—adding spouses/children, adding biographical information, adding genetic information, and so on. A table-based data entry feature makes matters even simpler.

The real power of Cyrillic, however, is in the way it handles genetic markers. Traits, diseases, haplotypes, etc. can be very easily added, and, more importantly, can be very distinctively represented using different colours and styles. A perpetual problem in drawing family trees is the choice of the level of detail. On the one hand, one would like to prepare as comprehensive a data set as possible—this is essential for detecting some not-so-obvious connections. On the other hand, the drawing tends to become more and more complex, to the extent of being unintelligible as more traits are added. Cyrillic neatly finesses the problem by providing unlimited flexibility in the choice of detail that you wish to represent at any given time. A click of the mouse gives a menu, and you can mix and match at will. The tree is instantly drawn to enable you to explore a large number of combinations till you zoom in on the best one (and yes, you can zoom in and zoom out to change the size as well).

Cyrillic has one of the most flexible sets of printing options that I have seen. It allows you to customize the drawing at the preview stage in various ways, very easily; particularly noteworthy is the facility to change the size of the drawing in steps of 5%. Both colour and black-and-white drawings come out very well—ready to be sent for publication. There was, however, a slight mismatch between the 'preview' and what actually came out in the printout. On the positive side, a cluttered-looking and overlapping box (in the preview) describing the meanings of symbols was well separated in the printout. On the negative side, the landscape versus portrait orientations did not match between preview and printout, and the drawing was unnecessarily spread over more than one sheet (this also showed the capability of the software to print very large trees by

spreading them over several sheets). There was also a slight difference between the selected size and the obtained one. However, with a little more familiarity with the software, these minor irritants can easily be avoided.

Finally, it is not just data compilation, editing, visualization and printing—Cyrillic can carry out some useful analysis as well. It can automatically detect consanguinity; it can calculate inbreeding and kinship coefficients; and it can perform risk assessment as well. More importantly, it allows export of data in a form that can be readily accepted by other, more sophisticated and special-purpose programs for analysis. It can also import files from several other formats. The manual gives a very detailed description of the formats of the files used by Cyrillic. This is just another instance where one can see that development of this software is more a labour of love, something created by one experienced scientist for others of the clan, and not something commissioned after a careful market survey and with an eye on the balance sheet.

Support for the software is advertised on the website of the publishers (www.cherwell.com), and that is where one can obtain pricing and ordering information as well. In step with the shift towards e-commerce, you can order it on the web itself—a form-based interface allows you to key in the details (nearest dealer, whether government/academic/commercial buyer, etc.) and generates a price statement for you. For both academic and government users from the 'Rest of the world', Cyrillic costs 449 pounds—about Rs. 31,000 as of December 1998 [But note the Indian price provided by the authorized Indian distributor: Rs. 44,000.—Ed.]. It is difficult to decide whether this means 'affordable' or 'too high'. On the one hand, the 'open software' culture has released far more powerful, complex and useful packages (the Linux operating system, the GNU C and C++ compilers, for example) absolutely free of charge. On the other hand, especially in clinical situations, even if one patient is helped by use of this software (which can very well happen), the price is trivial in comparison with the return. On the whole, for laboratories and departments where pedigree drawing and analysis are needed on a routine basis, it would be very worthwhile to invest in Cyrillic 2.1, as matters stand today.