

## Robert J. Sprafka -- COMPUTERS and DIGITAL ELECTRONICS

### Computer Applications and Systems

**UBUNTU** 6.06 thru 12.04, **Windows** 7, Vista, XP(prof), XP(home), ME, 98(2<sup>nd</sup> ed.), 95b, 95a, 3.1, some NT4; **MS-DOS** 3.30 through 6.22. **VAX/VMS** in late 1980's. **Networking:** 10/100BaseT LAN's; Wireless LAN; Win 95,98,XP,Vista,7. **Word processing:** OpenOffice, LibreOffice, SuperScripsit, Wordstar, WordPerfect, AmiPro, and Microsoft Word. **Spreadsheet:** LibreOffice Calc, OpenOffice Calc, Microsoft Excel, Quattro and Lotus. **DBase** II, III+, some Microsoft Access and DEC DataTrieve. PERT and Gantt charting, computer mapping, MIDI file creation and editing. AUTOSKETCH. Scientific and engineering graphing. Some Power-Point. Microsoft Office '95, '97, LibreOffice, OpenOffice, and Corel Suite 2000.

Use of **PLC's** in industrial control and monitoring applications, Eaton-Cutler-Hammer D100 and D200 series, Opto-22 LC2 series, GE Fanuc series. Data Acquisition hardware, standalone and PC based (1988-1997).

Fluent in **Internet** applications: Browsers (MS IE, Firefox, Opera), FTP, e-mail. Competent in HTML (I have created Web pages for myself, a theater group, a singing group, and a law firm. Familiar with computer sound files (\*.wav, \*.mid,.mp3), graphics formats, and picture editing for web use (\*.gif, \*.jpg). Fluent in data transfer between host sites and field data collection apparatus. Various text editors, memory dump and tape dump editors/patch programs, disk patching, IS file creation and maintenance programming.

Competent to use music notation and sequencing programs: Noteworthy Composer, CODA Finale Allegro, Cakewalk.

### Computer Hardware / Languages

**FORTRAN** on IBM 704, 7090, 7094, 7040, 7044, 1401, 360 (1961-67); CDC 6600, 3600, 6500, CYBER 170 and 810 (1967-82); DataCraft (Harris) 6024/3 (1970); Honeywell DDP-24, 124, 224 (1970-1772); DEC PDP 11/40, VAX 750, 780, MicroVAX II (1974-89); TRS-80 Model I, III (1981-88). Taught "Leahy FORTRAN" (Winter 94) and Turbo-**PASCAL** (Winter 93) at Lakeland Community College.

**BASIC** on PDP-11/40 (1974-78), Apple II-Plus (1981), IBM PC and compatibles (1983- ongoing), TRS-80 Model I and III (1981-88), Opto-22 LC-2 (1991-92).

**Assembly** Language for Purdue Datatron 205 (1959-60); IBM 7040, 7044, 7090, 7094, 1401 (SPS, Autocoder), System 360/40 and 44 (1961-67), CDC 3600 (1967-72), CDC 6500 (1969-74), TRS-80 Model I (1982-85), IBM PC (1989-95).

**Machine Language** (absolute coding and patching) for DATATRON 205 (1959-60), IBM 1401 and 7044 (1963-66), Varian 620i (1971-72).

Principal **Systems Programmer** for IBM 7044 (1964-66). Modified IBSYS operating system to accommodate time sharing between on-line digitizers and analysis programs, and implemented software side of home-made link to IBM 1401 -- a form of early networking. Designed minicomputer to mainframe dial-up intercommunication protocol for PDP-11/40 ->CDC 6500 at Michigan State University (1975-76).

**System manager** for IBM 7044 (1964-66), DEC VAX 750 and 780 (1984-89), DEC MicroVAX II (1987-90). **Security manager** for the latter two machines.

IBSYS on early IBM 7xxx series mainframes, VMS for DEC VAX series, RT-11 for PDP 11-40, SCOPE and MSU Hustler for CDC mainframes.

### Major Systems Design Projects

Created the East Ohio Gas Technical Market Support Data Logger system for industrial data acquisition tasks to monitor natural gas technologies in the field over long run times. (1988-95)

Responsible for design of a PLC based control system for a Liquid Natural Gas (LNG) truck refueling station to evaluate the feasibility of LNG for a short and long haul trucking client. (1992-97).

Created a dial-up access legislative information retrieval database for Hannah Information Systems (Lansing, Michigan 1984-87). This system had 12 client dial-up phone lines in Michigan, 6 client dial-up lines in Columbus, Ohio, 8 office ports in Ohio and 6 office ports in Michigan. The implementation was done on one DEC VAX 750 with a multiplexed dedicated phone line between Lansing and Columbus.

Reviewed data flow and communications in three Michigan mid-size county health departments and the Michigan Association of Substance Abuse Coordinating Agencies, culminating in recommendations for purchase installation of minicomputer + PC networks for data and e-mail (1984-88).

Created and supervised a health information system which relied on dial-up access to the Michigan State University CDC 6500 from 8 sites across the State of Michigan, resulting in the input of 150,000 patient encounters per year into the mainframe. Designed report formats for meaningful summarization for clinic staff, residency directors, and family practice residents. (1976-83)

Directed and implemented the data reduction of a two million trigger spark chamber data reduction experiment on the CDC 6500 (1970-72). This experiment ultimately required 1.5 million seconds of CPU time on the 6500 -- all work was performed without special privileges or scheduling within a 5-month period -- without disrupting normal throughput of the campus 6500, used for all students and researchers.

Chief designer for the Michigan State University High-Energy Physics bubble chamber film

digitizing laboratory (1967-72). This facility used off line digitizers interfaced to incremental tape drives. Directed the ordering, installation, calibration, and use of the digitizers. Directed and performed 50% of the software development required for the data reduction (which required 2-3 hours/day of CDC processor time). (The total software development and adaptation was 2 person years)

One of a team of several physicists/engineers that assembled the Purdue High-Energy Physics bubble chamber film data analysis laboratory (1963-66). This facility included seven real-time digitizers (several with data rates on the order of 100/second), console typewriters for each station, and two linked computers which permitted three shift / seven day data acquisition while also allowing physics analysis computing to take place simultaneously. (This represented an early form of multi-tasking as well as computer networking).

### Electronics

High-speed pulse electronics (up to 200 MHz rates) associated with particle detectors in high-energy physics (1962-72). Real time diagnostic and calibration equipment for bubble chamber film digitization equipment (1964-72). Supervision of programmers for psychophysiology laboratory real time data acquisition from human subjects, data smoothing, and data summarization (1975-79). Maintained and modified semi- automatic digitizers (1963-66) and off line digitizing equipment (1968-72). Taught honors physics laboratory and radioactivity laboratory. Use of Kiethly-Metrabyte A/D, counter-timer and thermocouple interface boards in 80x86 microcomputers for monitoring performance of energy systems (1987-98).

### Publications

17 in general field of alternative energy systems (1981-1986), 8 in general field of health services (1973-1983), 38 in particle physics (1963-1973). (A full list is available on request)

### University Committee Assignments

From 1969-81, as a faculty member, I served on several all-campus computer policy committees at Michigan State University:

- Operations Committee
- Ad Hoc Committee on Pay and Priority Policy
- Computer Laboratory Advisory Committee
- Equipment Acquisitions Committee
- Research Users Committee
- Computer Communications Committee (set policy for networking the campus)