

AUTHOR INDEX

(Page numbers are in roman type for text references, italic for bibliography entries. Chapter numbers preceded by CH.)

- Abelson, R. P., 556, 557, 560
Agarival, K. K., 297
Agin, G. J., 225
Aho, A., 377, 380
Aiello, N., 277, 283, 298
Aikins, J. S., 276, 296, 299
Albus, J. S., 524, 529
Almgren, F. J. Jr., 238
Amarel, S., 283, 296, 299
Anderberg, M. R., 175, 195
Anderson, R. H., 283, 296
Angebrannt, S., 357, 358
Appelt, D., 41, 71
Arbib, M. A., CH.25, 501, 502, 504, 505,
509, 510, 512, 516, 517
Asimov, Isaac, 555, 556, 560
Averbakh, Y., 90, 95, 102, 103, 104, 105,
120
Axline, S., 299
- Ballantyne, A. M., CH.1, 39
Balzer, R., 283, 296, 343, 358
Barlow, H. B., 502, 516, 529, 529
Barret, E., 286
Barrett, P., 297, 323
Barrow, H. G., CH.11, 225, 238
Barstow, D. R., CH.18, 274, 296, 380
Bathor, M., CH.10, 225, 226
Beal, D., 102, 120
Belen'kiy, A. S., 396
Bell, A. G., 296
Bendix, P., 144
Bennett, J., 283, 296
Bennett, M., 39
Bennett, W., 39
Berge, C., 483, 497
Bergman, M., 441, 453, 456, 469
- Berliner, H. J., 116, 120
Berzins, V., 422, 440
Beth, E. W., 427, 440
Bibel, W., 380
Binfold, T. O., 225, 296
Bizzi, E., 526, 528, 530
Bledsoe, W. W., CH.1, 13, 39, 142, 143, 144,
440
Blomfield, S., 521, 529
Blum, R., 299
Bobrow, D., 283, 296
Boden, M., 553
Boehm, B. B., 421, 422, 440
Boivie, R. H., 297
Bolles, R. C., 225
Bonnet, A., 274, 296
Boothroyd, G., 255, 266
Bowen, K. A., CH.21, 427, 429, 434, 438,
440
Boyer, R. S., 143, 407, 419, 423, 440
Boylls, C. C., 505, 516
Brachman, R. J., 276, 296
Bramer, M., 102, 120
Bratko, I., CH.3, 73, 74, 87, 95, 106, 107,
114, 120, 478, 485, 488, 497
Braun, H., 299
Brentano, F., 544, 553
Brooks, R., 274, 296
Brown, J. S., 274, 284, 296
Bruell, P., 39, 144
Brugnooghe, M., 419, 496, 497
Buchanan, B. G., CH.14, 172, 276, 277, 278,
280, 296, 297, 298, 299
Bulthoff, H., 520, 529
Bundy, A., 274, 296, 441, 453, 456, 469
Burstall, R. M., 270, 296
Burton, R. R., 296
Byrd, L., 296, 441, 453, 469

AUTHOR INDEX

- Card, W. I., 559, 560
 Carhart, R. E., 271, 296
 Carnap, R., 553
 Cheriton, D., 373, 380
 Chervonenkis, A., 396
 Chetverikov, D., 225
 Chidananda, 195
 Chin, M. Y., 475
 Chisholm, R. M., 547, 553
 Cho, F., 266
 Choplin, F., 299
 Church, A., 52, 71
 Clancey, W. J., 274, 278, 296, 298, 299,
 334, 337
 Clark, K. L., CH.23, 399, 419, 496, 497
 Clarke, 112
 Clementson, A., 266
 Clowes, M., 255
 Cohen, B. L., 172
 Cohen, P. R., 71
 Cohen, R. M., 144
 Cohen, S. N., 299
 Coleman, B. D., 523, 529
 Coleman, S. R., 537
 Collett, T. S., 520, 530
 Colmerauer, A., 419, 449, 453, 453, 456,
 457, 469
 Connor, 286
 Constable, R. I., 423, 440
 Corey, E. J., 270, 296
 Corkhill, D., 277, 297
 Cox, D. P., 319, 323
 Creary, L. G., 42, 71
 Crick, H. C., 522, 529, 529
 Crocker, S., 297
 Cromarty, A. S., 502, 504, 517
 Cross, 455

 Dahl, V., 441, 453, 453
 Dannenberg, R. B., 127, 144
 Darvas, F., 441, 453, 456, 469, 470
 Davis, R., 271, 276, 279, 285, 297, 298,
 299
 De Kleer, J., 275, 297
 Detra, D. E., 319, 323
 Detterman, R. L., 319, 323
 Diday, E., 175, 180, 195
 Didday, R. L., 512, 516
 Dietterich, T. G., 172
 Dijkstra, E. W., 378, 380, 422, 440
 Doyle, J., 63, 71, 225, 276, 297
 Duda, R. O., 172, 225, 247, 272, 297, 305,
 312, 321, 322, 323, 462, 470
 Dwiggins, D. L., 441, 453

 Eastlake, D., 297
 Englemore, R. S., 274, 283, 296, 297
 Erman, L. D., 271, 296, 297

 Ernst, G. W., CH.5, 124, 125, 131, 142,
 144, 282, 297
 Ewert, J. P., 502, 508, 509, 510, 512, 515,
 516

 Fagan, L., 276, 297, 299
 Falk, G., 238
 Feigenbaum, E. A., 159, 172, 273, 274, 275,
 280, 283, 296, 297, 298
 Fine, R., 485, 497
 Forgy, C. L., 283, 297, 327, 337
 Friedland, P., 276, 297
 Fu, K. S., 225
 Futo, I., 441, 453, 456, 470

 Gallo, V., 225
 Gaschnig, J., CH.15, 159, 172, 297, 301,
 305, 311, 318, 323, 470
 Genesereth, M. R., 274, 297, 343, 358
 Gentzen, G., 421, 440
 Gerhart, S. L., 124, 144
 Gillogly, J. J., 283, 296
 Goldman, N. M., 343, 358
 Good, D. I., 143, 144
 Good, I. J., CH.29, 556, 559, 560
 Gorenzano, I., 537
 Gorry, A., 298
 Gowda, K., 195
 Graves, S. C., CH.13, 266
 Green, C. C., CH.17, 339, 342, 343, 358,
 361, 380, 419
 Greenblatt, R. B., 270, 297
 Greiner, R., 296
 Gries, D., 380, 440
 Grinberg, M., 275, 298
 Gustavson, R. E., 255, 266
 Guzman, A., 225

 Hamberger, M., 270, 297
 Hammond, P., 470, 471-475
 Hanani, U., 180, 195
 Hannigan, J., 299
 Haralick, R. M., 225
 Hare, D. R., 144
 Harf, M. J., 156
 Hart, P. E., 172, 247, 297, 305, 323, 470
 Hartoch, G. P., CH.9, 207
 Hassirer, J., 298
 Hausen, K., 520, 530
 Hawkinson, L. B., 299
 Hayes, P. J., 41, 43, 56, 71, 77, 542, 553
 Hayes-Roth, F., 95, 172
 Hearn, A., 270, 297
 Hendrix, G. G., 247
 Hewitt, E., 39
 Hill, R., 405, 419
 Hinde, R. A., 530
 Hirsch, H. V. B., 531, 537

- Hoare, C. A. R., 127, 144, 422, 440
 Hoch, C. G., 144
 Hogan, N., 526, 527, 528, 529, 530
 Hollerbach, J. M., 524, 525, 526, 529, 530
 Hookway, R. J., CH.5, 124, 127, 128, 131,
 138, 142, 144
 Hopcraft, J. E., 377, 380
 Horn, B. K. P., 225, 523, 524, 530
 Hubel, D. H., 531, 537
 Huberman, B. J., 483, 497
 Hueckel, M. H., 225
 Huet, Gerald, 4, 39
 Huffman, D. A., 238
 Hummel, R. A., 225
 Hunt, E. B., 172
 Hunter, L. W., 144

 Ichbiah, J. D., 125, 144
 Ingalls, D. H., 341, 358
 Ingle, D., 502, 503, 512, 517

 Jech, T., 428, 440
 Jensen, F. E., CH.27, 531, 532, 533, 537
 Johnson, C. R. Jr., 296
 Jones, C. B., 422, 440, 559
 Jones-Lee, M. W., 559, 560

 Kahane, J. P., 526, 530
 Kandel, E. R., 502, 517
 Kanger, S., 421, 429, 440
 Kanoui, H., 419, 441, 449, 453, 455, 456,
 469, 470
 Kant, E., 340, 358
 Kaplan, D., 45, 52, 71
 Karalazin, G., 286
 Kedzierwski, B., 358
 Kerschenbaum, A., 378, 380
 Khoroshevskiy, V. F., 396
 King, J. C., 142, 144
 Kleene, S. C., 44, 71, 423, 440
 Kling, R. E., 276, 297
 Knuth, D., 144
 Kohonen, T., 198, 207, 525, 530
 Kolmogorov, A. N., 526, 530
 Kondoleon, A. S., 255, 266
 Konolige, K., CH.2, 42, 55, 67, 68, 71, 247,
 297, 321, 323
 Kopec, D., 102, 120, 166, 172, 478, 497
 Kowalski, R. A., 71, 358, 399, 400, 402,
 419, 424, 434, 440, 455, 459, 470,
 478, 496, 497
 Kreisel, G., 421, 440
 Krishna, G., 195
 Kruskal, J. B., 373, 380
 Kuhn, A., 270, 297
 Kuijpers, B., 276, 297
 Kulikowski, C., 283, 299
 Kusunok, K., 266

 Land, M. F., 520, 530
 Landin, P. J., 399, 400, 419
 Langley, P., 284, 297
 Lara, R., 502, 509, 510, 512, 516, 517
 Larsen, D. L., 297
 Larson, J. B., 195
 Lazar, G., 503, 504, 517
 Lee, C. Y., 553
 Lee, R. C. T., 381,
 Lenat, D. B., 27, 39, 284, 297, 343, 358
 Lesser, V. R., 271, 277, 297
 Lettvin, J. Y., 501, 512, 513, 517
 Levin, D., 396
 Lindsay, R., 270, 298
 Liskov, B. H., 422, 440
 Ljubimski, E. Z., 156
 London, P., 296
 Lopata, A., 469
 Luckham, D. C., 143, 144, 422, 423, 440
 Luger, G., 296, 453, 469
 Luh, J., 524, 526, 530
 Lynch, P. M., 255, 266

 Maizelis, I., 90, 95, 102, 120
 Manna, Z., 342, 358, 361, 380, 421, 440
 Mannisalu, M. A., *et al.*, 156
 Markusz, Z., 441, 453, 456, 470
 Marr, D., 234, 238, 519, 520, 521, 522, 529,
 530
 Martin, W. A., 299
 Masinter, L., 341, 359
 Maturana, H., 501, 512, 517
 McCabe, F. G., CH.23, 419, 455, 470, 475,
 496, 497
 McCarthy, J., 41, 42, 43, 50, 56, 71, 134,
 144, 225, 272, 275, 277, 298, 542, 553
 McCulloch, W. S., 501, 517, 559
 McDermott, D., 225, 400, 419
 McDermott, J., CH.16, 172, 274, 283, 297,
 326, 328, 337
 Mellish, C. S., 296, 441, 453, 455, 469, 496,
 497
 Mendelsohn, E., 425, 426, 440
 Merat, F. L., 207
 Mero, L., 225
 Metzler, J., 537
 Meyers, Dr. Jack, 273
 Michalski, R. S., CH.8, 161, 172, 177, 195
 Michie, D., 73, 95, 96, 106, 120, 171, 172,
 477, 478, 485, 488, 495, 497
 Mikulich, L. I., CH.19, 396
 Mills, H. D., 422, 440
 Minor, J. T., 4, 39
 Minsky, M., 156, 225, 275, 276, 298
 Misra, J., 380
 Mitchell, T. M., 172, 279, 296, 298
 Mont-Reynaud, B., 358
 Mooney, G. H., 559, 560

AUTHOR INDEX

- Moore, J. S., 143, 144, 407, 419, 423, 440
 Moore, R. C., 41, 42, 43, 56, 58, 61, 66, 68, 71
 Moses, J., 270, 298
 Mozetic, I., 73, 95
 Musser, D. R., 143, 144
- Nakano, K., 198, 207
 Naydyonova, H., 396
 Negri, P., 172
 Nelson, G., 143, 144
 Nelson, R. J., CH.28, 553
 Nepeivoda, N. N., 156
 Nevins, J. L., CH.13
 Newell, A., 271, 275, 281, 282, 297, 298
 Niblett, T. B., CH.4, 74, 87, 95, 102, 107, 114, 120, 166, 172
 Nielson, K., 560
 Nii, H. F.
 Nii, H. P., 274, 277, 283, 298
 Nilsson, N. J., 60, 67, 68, 71, 92, 95, 195
 Nishihara, H. K., 522, 530
 Novak, G., 274, 298
- O'Donnell, M. J., 423, 440
 Ogden, W. F., 125, 144
 Oh, S-Y., 207
 Oppen, D. C., 143, 144
- Painter, J. A., 134, 144
 Palmer, M., 296, 441, 453, 469
 Pao, Y-H., CH.9, 207
 Pasero, R., 419, 469
 Pauker, S., 270, 298
 Paul, R., 530
 Pavlidis, T., 225
 Pereira, F. C. N., 74, 78, 95, 359, 419, 441, 442, 453, 454, 455, 456, 470, 495, 498
 Pereira, L. M., 74, 78, 95, 359, 419, 441, 442, 453, 454, 455, 456, 470, 495, 498
 Perrault, C. R., 71
 Phelps, R. W., 537
 Phillips, J. P., 339, 358
 Pitrat, J., 74, 95
 Pitts, W. H., 501, 517
 Poggiao
 Poggio, T., CH.26, 519, 520, 525, 529, 530
 Polit, A., 526, 530
 Pople, H. E., 270, 277, 298
 Pravitz, D., 421, 440
 Pressburger, T., 358
 Prim, R. C., 373, 381
- Quine, W. V. O., 50, 71
 Quinlan, J. R., CH.7, 172
- Raibert, M. H., 523, 524, 530
 Ramsey, F. P., 557, 560
 Raphael, B., 80, 95
 Rawls, J., 557, 560
 Ramsey, B., 80, 95
 Reboh, R., 247, 297, 323
 Reichardt, W., 520, 530
 Reiger, C., 275, 298
 Rich, C., 343, 358
 Rissland, E., 27, 39
 Roach, C. H., 323
 Roberts, G. M., 470, 497
 Roberts, L. G., 225, 238, 419, 455, 496
 Robinson, J. A., CH.20, 419, 429, 430, 438, 439, 440, 453, 458, 470, 496, 497
 Rosenfeld, A., 225
 Rosser, B., CH.26
 Roussel, P., 399, 419, 441, 453, 455, 458, 469, 470
- Sacerdoti, E. D., CH.12, 247, 276, 298
 Safir, A., 299
 Sagalowitz, D., 247
 Samuel, A. L., 270, 275, 277, 298
 Sanders, A. F., 297
 Santane-Toth, E., 456, 470
 Savage, L. J., 557, 560
 Schoenfield, J. R., 425, 426, 440
 Schonberg, J., 343, 359
 Schultz, W. L., 207
 Schwartz, J. T., 440
 Schwartz, W., 298, 422, 423
 Scott, A. C., 278, 299
 Searleman, J. E., 297
 Seigler, A., 225, 226
 Shannon, C. E., 477, 497
 Shapiro, A., 102, 119, 120
 Shapiro, C., 320, 323
 Shaw, J. C., 298
 Shirai, Y., 226
 Shortcliffe, E. H., 247, 270, 285, 297, 298, 299, 462, 470
 Shostak, R., 39, 143, 144
 Show, G. B., 226
 Shrobe, H., 343, 359
 Sibert, E. E., CH.20, 440, 496, 497
 Sieber, W., 299
 Siegler, A., 226
 Siklossy, L., 5, 39
 Silva, G., 441, 453
 Simon, H. A., 281, 282, 298, 381
 Simon, J. C., 175, 180, 195
 Slocum, J., 247, 297
 Sloman, A., 545, 553
 Smith, M. C., 534, 537
 Smith, R. G., 277, 296, 298, 299
 Smullyan, R., 427, 440

AUTHOR INDEX

- Sneath, P. H., 189, 195
 Sokal, R. R. 189, 195
 Solberg, J., 266
 Soloway, E., 27, 39
 Spinelli, D. N., CH.27, 531, 532, 533, 537
 Spritzer, G. A., 297
 Steele, B. D., 337, 475
 Steele, G. L., 446, 454
 Steels, L., 283, 299
 Stefik, M., 271, 276, 283, 299
 Stepp, R., CH.8, 177, 195
 Stevens, K., 230, 238
 Strachey, C., 399, 400, 419
 Stromberg, K., 39
 Sugihara, K., 226
 Sugimori, Y., 266
 Sussman, G. A., 274, 276, 299
 Suzuki, N., 143, 144
 Swartout, W., 278, 299
 Szekely, G., 503, 504, 517
 Szentagothai, J., 517,
 Szeredi, P., 441, 453, 456, 470
 Szolowits, W., 283, 299

 Takeuti, G., 421, 427, 432, 436, 440
 Tarjan, R. E., 373, 380
 Tan, S. T., 74, 95, 102, 120
 Taylor, J. E., 238
 Teitleman, W., 341, 359
 Tenebaum, J. M., CH.2, 225, 238
 Terry, A., 274, 297
 Thomas, L., 555, 560
 Torre, V., 525, 530
 Tsuji, S., 226
 Tsukahara, N., 505, 517
 Turner, D. A., 454
 Turner, K., 238
 Tyson, M., 142, 144
 Tyugu, E. H., CH.6, 156

 Uchikawa, S., 266
 Ullman, J. D., 377, 380

 Vamos, T., CH.10, 225, 226
 van Caneghem, M., 453, 470

 van Emden, M. H., 419, 495, 497
 van Melle, W., 282, 299
 van Slyke, R., 380
 Vassy, Z., 225, 226
 Vere, S. A., 172
 Viani Di Prisco, G., 537
 von Seelen, W., 516

 Walker, M., 530
 Waldinger, R., 342, 358, 361, 380, 421, 440
 Waltz, D., 226, 238
 Wang, H., 421, 440
 Warren, D. H. D., CH.22, 67, 71, 74, 78, 343,
 359, 411, 419, 440, 441, 442, 453, 454,
 456, 470, 495, 496, 498
 Watanabe, S., 196
 Waters, W., 343, 359
 Waterman, D. A., 77, 95, 271, 299
 Watson, W., 320, 323
 Wegner, P., 440
 Wehrhahn, D., 520, 529, 530
 Weiss, S., 270, 283, 299
 Westfold, S. J., CH.17, 358
 Weyhrauch, R. W., 42, 47, 60, 71, 343, 359
 Whitney, D. E., CH.13, 266
 Wiesel, T. N., 531, 537
 Wile, D. S., 124, 144, 343, 358
 Wilkins, D., 74, 95, 116, 120, 274, 299
 Williams, C., 296
 Willshaw, D., 198, 207
 Winograd, T., 226, 283, 296
 Winston, P. H., 196, 276, 299
 Wipke, W. T., 270, 296, 299
 Wirth, N., 125, 144
 Witkin, A., 231, 238
 Wraith, S. M., 299

 Yachida, M., 226
 Yu, V. L., 280, 286, 288, 289, 299, 305,
 323

 Zadyhailo, I. B., 156
 Zucker, S. W., 225
 Zuidema, C., 485, 498



SUBJECT AND NAME INDEX

(Page numbers are in roman type, CH. precedes chapter numbers. Names only appear which are in no sense bibliographic references; otherwise they are to be found in the author index.)

- ADA language, 125
- Adams, S., 312
- Adamson, chess studies by, 98, 99
- ADES, (Analytical Design Evaluation System), 254, 259, 262
- advice,
 - for chess end-game, 477, 478, 484-497
 - inverse advice relationship, 87, 89
 - list, 73
- AL1, (Advice Language 1), 106, 113
- AL3, (Advice Language 3) problem solving system, CH.3
- Advice Taker, the, 275
- AGE system, 283
- Alaska, land-use study the by PROSPECTOR, 319-320
- ALGOL, 151, 363, 446, 485
- algorithm design, CH.18
- algorithm to perform search in KPK end-game, 114-116
- ambiguity in perceiving line drawings, 228
- AM program, 284
- ANIMATOR graphic motion simulation program, 217, 218, 223
- APL language, 124
- Apple micro-computer, 455
- AQ 11 program, 192, 194
- Aristotle, 546
- assembly system research, CH.13
- automatic alternator assembly, 251
- automatic program synthesis, CH.18
- axioms,
 - of knowledge and action, 42-68
 - of logic systems, 425-439
 - in program synthesis, 151-155
 - of topology, 6-8
- Backus-Nauer form of notation, 107
- backward chaining, 136, 140-142, 457, 458
- BACON program, 284
- Bayesian principle of rationality, 557
- Bayesian system, 473
- Bayes' Theorem, 270
- belief-nesting, 42, 46, 53, 62
- belief-revision, 63
- Bionics Research Laboratory, 202
- Boyer-Moore technique, 405
- Brentano, 545, 547
- Brentano's thesis, 544
- CAD technology, 395
- CAN-Q system, 255
- CAPS/ECSL system, 255
- Carnegie-Mellon, 283, 325, 326, 544
- Case verifier, system for mechanical theorem-proving, CH.5
- causal models, 275
- checkers program, 270, 275
- chess end-games, 73-77, 86-100, CH.7, 477, 478, 484-497
- chess program, 270, 274
- Chester, D., 29
- CHI system, 339, 343, 349, 354, 357
- Church's Thesis, 423
- closure, in implementing functional objects, 448
- cluster analysis, CH.8
- CLUSTER program, 173, 175, 187-189, 192-194
- COMPLEX data structure, 188
- computers,
 - CDC Cyber 72, 170
 - DEC KL-10, 167, 169

SUBJECT AND NAME INDEX

- computers — *continued*
 IBM, 370, 455
 ICF DEC-10, 116, 119
 PDP-11, 215, 216, 326, 337, 455
 VAX-11, 325, 326, 337
 computer-controlled machines, 249
 computer systems, natural-language access to, 244
 configuration design, RI's role in, 326-333
 conflict set, in problem solving, 78
 CONGEN, 271, 272, 284
 control module of AL3, 94
 counter-examples, the use of in automatic theorem proving, CH.1
 CPDL grammar description language, 214, 220
 Crystal of Knowledge, reallocation of neural elements viewed as, 531
 CSDL advanced assembly research activities, 250
- DARPA, 285
 data-objects, treating functions as, 444-447
 database query languages, 424
 DEC-10, 399, 455
 DEC-10 PROLOG, 442, 448, 450, 456, 462
 DEC LSI-11/02 microcomputer, 243
 Dedekind, 546
 deduction cycle, in LOGIC system, 404-406
 deduction window, in LOGIC system, 410
 dendograms, 190-192
 DENDRAL system, 270, 271, 278, 279, 280
 Didday model of prey selection, 512
 Digital Equipment Corporation (DEC), 325, 326
 DISPUT systems, 383-388, 395, 396
 Draper Laboratory, 249, 250
 dynamic data-base, in expert systems, 460, 461
- ECSU model, 311-313
 eigenvariable condition, in logic programming, 426
 EMYCIN, 282, 283
 existence proofs, CH.28
 existence theorem, in program synthesis, 145, 151, 152
 EXPERT, 283
 expert systems,
 new research on, CH.14
 a language for implementing, CH.23
- factor analysis, 174
 Fixed Action Patterns, 521
 Floyd/Hoare assertions, 125
 FMS, 255
 FOL system, 343
 Ford Alternators, 255
- FORTRAN, 332, 400
 Foster, E. M., 555
 Frege quotes, 45
 frog and toad, models of visual co-ordination in, CH.25
- Gacs, Peter, 164
 Gaussian curvature, 234
 GD'80 microcomputer, 222, 224
 GD'80 multiprocessor graphics terminal, 215
 Gentzen's sequentzen system, 421
 Gentzen type systems, 129, 142
 geological exploration problems, CH.5
 gestalt perception, 543
 gestalt property of objects, 176
 GIST, 343
 GLAUCOMA, 270
 goals and sub-goals,
 in chess end-games, 75, CH.4, 485-489
 in predicates of arguments, 442-447
 in problem solving, CH.3
 GOALTEST lemma, 84
 GPS, 276
 GRAPHER, 7-15
 graphic modelling, in robotics, 216
 graphic teaching, 221
 Grigoriev, 99, 100
 GUIDON, 278, 334
- Hamel basis, 37
 Hammond fault-finder system, 456
 HARPY, 271
 Harris, 102
 hashing, 197
 HEARSAY, 271, 277, 544
 Hearsay III, 283
 Herbrand universe, 428
 Heuristic Compiler, 361
 Heuristic Programming Project, 167, 285
 Hilbert-style proofs, 46, 47, 426
 Husserl, 547
 Huxley, Aldous, 558
- IC-PROLOG, 496
 ID3 system, 162, 167-170
 IDOS, interactive operating system, 213
 INDUCE system, 161, 162
 inductive inference, revealing conceptual structure in data by, CH.8
 instantiation,
 in expert systems, 468
 in theorem-proving, 138, 140-142
 intentional attitudes of the mind, 544, 545
 INTERLISP, 341, 383
 Intermediate Value Theorem, 17-22
 INTERNIST, 270-273

SUBJECT AND NAME INDEX

- Interpreter, of natural language, 385-387
 ISI, 283
 ISODATA system, 174
- Josef Stefan Institute, 73, 95
- Kalah, game of, 484
 Kestrel Institute, 358, 374
 knowledge,
 acquisition in expert systems, 278-288
 -based systems, 102-119, CH.14, CH.17
 base for KPK, 90-92
 computer utilization of, CH.24
 engineering, 279, CH.24
 LOGIC knowledge base, 402, 410-418
 representation, 101
 the role of in algorithm design, CH.18
 semi-autonomous acquisition of, CH.7
 Knuth-Bendix rewrite rules, 135, 143
 Konig's Infinity Lemma, 428
 Kolmogorov's Theorem, 526
 Kripke, 42
 KRL language, 283
 Kruskal's algorithm, 373-378
- LADDER system, 244
 language, natural language dialogue systems,
 CH.19
 Laplace, 557
 Linguistic Processor, 383-396
 LISP, 124, CH.16-CH.23
 LISP simplification process, 409, 410
 LJ system, 421
 LOGIC, CH.20
 logic programming, 432-439
 Logic Theorist, the, 275
 LOGLISP, CH.20
 LUSH resolution, 400, 405-408, 421
- machine intelligence, CH.12
 Machine Intelligence Corporation, 241-245
 MACSYMA system, 270, 280
 Marr's theory, of the cerebellar cortex, 520-522
 memory, fast access by similarity
 measure, CH.9
 META-DENDRAL, 160, 161, 284
 metalanguage, 42, 44-68
 meta-rules, 276
 Micro-PROLOG, 471
 MICROPLANNER, 11
 Miller, R., 271
 MIT, 231, 249, 270, 283
 MODBUIL program, 217, 223
 MODULA language, 123, 125, 143
 MOLGEN, 276, 280
 Moravec, 98, 99
- motor control, the computational problem
 of, CH.26
 MRS system, 343
- National Science Foundation, 144, 195, 244,
 254, 265, 285, 552
 National Uranium Research Program (NURE),
 301, 305
 natural language systems, CH.19
 NC program, 222
 Necker cube phenomenon, 543
 neural circuitry, models of, CH.25
 NID procedure, 186, 187
 Nim, the game of, 478-484
 NOAH, 276
 NUMTAX program, 189-191, 194, 195
 NURE pilot study, 313-318, 321
- object language, 42, 44-68
 ONR, 284
 OPS4 language, 283
 OPS5 language, 326, 327, 337
 OWL language, 283
- PAF algorithm, 180, 181, 182, 187, 189,
 192, 194
 paramodulation, in theorem-proving, 133, 138
 parser, 125
 Parts Tree technique, 258, 259, 262, 264
 PASCAL language, 167, 169, 171, 187, 188,
 213, 245, 423
 pattern-matching, 495
 pattern-recognition, 224
 pattern recognition in the toad, 508-511
 PECOS system, 362, 372, 379,
 PERQ, 474
 PIP program, 270
 PL/1 language, 423
 PLACES knowledge-base, 392-396, 411-418
 poker-playing programs, 271
 POP-2 language, 444, 446, 447, 495
 Pople, H., 273
 Post Production rules, 541
 Pragmatic Processor, 387, 388
 predicate calculus, in specification of the
 rule compiler, 342-349
 prey selection in the frog, 512-514
 Prim's algorithm, 377, 378
 PRIZ programming system, 156
 problem solving system, CH.3
 program, linking loader, 138
 program verification, 134
 programmable assembly system research,
 CH.13
 programming, with full first-order logic,
 CH.21
 programs, structural synthesis of, CH.6

SUBJECT AND NAME INDEX

- PROLOG, 74, 78, 79, 84, 96, 116, 119, 343,
 399, 400, 407, 411, CH.22, CH.23, 483,
 487, 488, 489, 496, 497
 proof tree, 17-20
 PROSPECTOR system, 159, 245, 272, CH.15,
 462, 464, 473
 PUFF, 283
 Puma manipulator, 244
 Purkinje cell, 521
 Purkinje inhibition, 505
 puzzles,
 Morningstar-Eveningstar description
 problem, 50, 277
 Tower of Hanoi, 269
 Wise Man Puzzle, 68-71

 Rackley, R., 306, 308, 312, 315
 Rana Computatrix, CH.25
 RAND, 283
 RC, (rule compiler), 340-357
 recovery techniques, in interpreting
 line-drawings as 3-dimensional
 surfaces, 232
 REDUCE, 10
 resolution,
 in logic programming, 429
 in the search for a counter-example, 4, 5
 Reti, 74, 96, 98
 RI knowledge-based configurer, CH.16
 RITA, 283
 Robinson's unification algorithm, 458
 robotics,
 problems in, CH.29
 in problem of trajectory control, 523-525
 "three laws of", 555
 robots, a robot vision lab concept, CH.10
 ROSIE, 283
 Russell, 544, 547
 Rutysers, 270, 283
 RWSSU model, 303

 SACON, 283
 Scheibel and Scheibel, 535
 SCHEME, 446
 Science Research Council, 95, 119
 search,
 heuristic, 73
 heuristic in robotics, 216, 219
 limit, 99
 minimax in KRKN chess ending, 169, 171
 specialised in KRKN chess ending, 169,
 170
 searching,
 in acquisition and matching of patterns,
 202
 in AL3, 84-100
 in chess; 105, 111-116
 in theorem-proving, CH.5
 systematic proof searching, 426-430

 SECD machine, 400
 Selender, R., 189, 195
 selectors in cluster analysis, 178, 188
 sensory deprivation, 531
 Sequentzen systems, 424-426
 SETL language, 343, 383
 Shostak, R., 28
 SHRDLU program, 545
 situation calculus approach in describing
 world changes and events, 56, 57
 skolem constants in theorem proving, 143
 skolem functions,
 in proof discovery, CH.1
 in theorem proving, 129, 130, 139
 SMALLTALK, 141
 Socrates, 556
 Spearman Rank Correlation Coefficient, 321
 specification problem, in programming, 422
 SPROUTER system, 162
 SRI, 159, 224
 Stanford University, 164, 167, 283, 285, 512
 STAR generating procedure, 182, 186, 187
 STRIPS planning system, 60
 structure-sharing in PROLOG, 448
 surface interpolation, in interpreting line
 drawings, 234-237
 symbolic execution, in generating
 verification conditions, 127
 syntactic distance, in cluster analysis, 178
 Syracuse University, 469

 Talcott, C., 68
 Tarski, 546
 TEIRESIAS dialogue program, 279
 THOTH-P system, 162
 TI system, 342, 343
 topology, automatically generating counter-
 examples in, CH.1
 trajectory control of limbs, 522-529
 transfer paradigm in programming, 363,
 364, 373, 375, 377, 379
 Turing machine, 542-545, 547, 550, 551, 559
 Tychonoff Plank, 16
 TYPELIST, 142

 ultra-intelligent machine, 557
 uniclass covers, 177
 Unimation Inc., 244
 UNITS language, 283
 'Univision' system, 244
 UNIX, 455

 VAL language, 244
 V. C. generator, CH.5
 verification problem, in programming, 422
 vision module, 242
 V language, 339-341, 344-357
 VL, language, 175, 178

SUBJECT AND NAME INDEX

VL21 language, 161
VS-100 image processing system, 243, 244

Walsh,
 sequence, 200
 transform domain, 203
 reference functions, 207

WSSU model, 311-313

XSEL program, CH.16

XRPT, 283

Z80 (micro-running CP/M), 455, 456, 474

THE MACHINE INTELLIGENCE SERIES . . .

The Machine Intelligence Series occupies a unique and universally recognised position in the world literature. The books have evolved from the unbroken sequence of now-famous Workshops conducted by the editor-in-chief Donald Michie, each planned to its own theme and organised as a carefully structured and cohesive source book.

No rigid demarcations are imposed between new results and tutorial overviews, which two elements are so blended as to stimulate and at the same time to instruct.

Novel discoveries and trends are set into a solid background of exposition, and related to previous knowledge in such a way as to serve an advanced tutorial function. No work can be a classic at the time of its publication, but some of the contributions are classics in the making.

The combined bibliographies put into the reader's hands the keys to virtually everything which is yet known in this subject.

MACHINE INTELLIGENCE

Editor-in-chief: Professor Donald Michie, Professor of Machine Intelligence,
University of Edinburgh

Volumes 1-7 published by Edinburgh University Press, and in the USA by Halsted Press (a division of John Wiley and Sons, Inc.).

Volume 8 onwards published by Ellis Horwood Limited, Chichester, and in the USA by Halsted Press (a division of John Wiley and Sons, Inc.).

MACHINE INTELLIGENCE 1 (1967)

Contents: Abstract Foundations
Theorem Proving
Machine Learning and Heuristic Programming
Cognitive Processes: Methods and Models
Pattern Recognition
Problem-Oriented Languages

MACHINE INTELLIGENCE 2 (1968)

Contents: Abstract Foundations
Mechanised Mathematics
Machine Learning and Heuristic Programming
Cognitive Processes: Methods and Models
Problem-Oriented Languages

MACHINE INTELLIGENCE 3 (1968)

Contents: Mathematical Foundations
Theorem Proving
Machine Learning and Heuristic Programming
Man-Machine Interaction
Cognitive Processes: Methods and Models
Pattern Recognition
Problem-Oriented Languages

MACHINE INTELLIGENCE 4 (1969)

Contents: Mathematical Foundations
Theorem Proving
Deductive Information Retrieval
Machine Learning and Heuristic Programming
Cognitive Processes: Methods and Models
Pattern Recognition
Problem-Oriented Languages
Principles for Designing Intelligent Robots

MACHINE INTELLIGENCE 5 (1970)

Contents: Prologue
Mathematical Foundations
Mechanised Reasoning
Machine Learning and Heuristic Search
Man-Machine Interaction
Cognitive Processes: Methods and Models
Pattern Recognition
Principles for Designing Intelligent Robots
Appendix

MACHINE INTELLIGENCE 6 (1971)

Contents: Perspective
Program Proof and Manipulation
Mechanised Reasoning
Heuristic Paradigms and Case Studies
Cognitive and Linguistic Models
Approaches for Picture Analysis
Problem-Solving Languages and Systems
Principles for Designing Intelligent Robots

MACHINE INTELLIGENCE 7 (1972)

Contents: Prehistory
Program Proof and Manipulation
Computational Logic
Inferential and Heuristic Search
Perceptual and Linguistic Models
Problem-Solving Automata

MACHINE INTELLIGENCE 8: Machine Representations of Knowledge (1977)

Contents: Knowledge and Mathematical Reasoning
Problem-Solving and Deduction
Measurement of Knowledge
Inductive Acquisition of Knowledge
Programming Tools for Knowledge-Representation
Dialogue-Transfer of Knowledge to Machines
Dialogue-Transfer of Knowledge to Humans
Case Studies in Empirical Knowledge
Perceptual Knowledge
World-Knowledge for Language-Understanding

MACHINE INTELLIGENCE 9: Machine Expertise and the Human Interface (1979)

Contents: Abstract Models for Computation
Representations for Abstract Reasoning
Representations for Real-World Reasoning
Search and Problem Solving
Inductive Processes
Perception and World Models
Robot and Control Systems
Machine Analysis of Chess
Knowledge Engineering
Natural Language

MACHINE INTELLIGENCE 9: Machine Expertise and the Human Interface

Preface by Professor Andrei Ershov, USSR Academy of Sciences

Edited by: J. E. Hayes, University of Edinburgh
D. Michie, Professor of Machine Intelligence, University of
Edinburgh
and
L. I. Mikulich, Artificial Intelligence Council of USSR Academy
of Sciences

MI9 emanates from an East-West forum when leading experts in Western Europe and North America joined forces with their Soviet counterparts at the 9th International Machine Intelligence Workshop at Repino near Leningrad in 1977. Work of the Soviet school (approximately half the book) in this explosively growing area of machine intelligence is thus made accessible for the first time to Western readers, in addition to the latest Western advances.

The emergent theme of knowledge-representation is supported on the theoretical and experimental sides by recent work in inductive inference and theory-formation. New results and authoritative summaries concern abstract models for computation, machine reasoning and problem-solving, perception, robotics, computer game-playing, interactive knowledge systems, and programs for understanding natural language text. The comprehensive and international bibliography (including a complete listing of the major papers in computer chess) gives guided access to the current world literature, including little-known recent Soviet research. It is thus invaluable for professional reference or for reading material for course study.

Readership: Advanced undergraduates, graduates and professional workers in the fields of
Computer and Information Science
Psychology
Linguistics
Philosophy
Mathematics
Brain Science

ISBN 0-85312-1125

THE ELLIS HORWOOD SERIES IN COMPUTERS AND THEIR APPLICATIONS

Series Editor: BRIAN MEEK

Director of the Computer Unit, Queen Elizabeth College, University of London

The series aims to provide up-to-date and readable texts on the theory and practice of computing, with particular though not exclusive emphasis on computer applications. Preference is given in planning the series to new or developing areas, or to new approaches in established areas.

The books will usually be at the level of introductory or advanced undergraduate courses. In most cases they will be suitable as course texts, with their use in industrial and commercial fields always kept in mind. Together they will provide a valuable nucleus for a computing science library.

INTERACTIVE COMPUTER GRAPHICS IN SCIENCE TEACHING

Edited by J. MCKENZIE, University College, London, L. ELTON, University of Surrey, R. LEWIS, Chelsea College, London.

INTRODUCTORY ALGOL 68 PROGRAMMING

D. F. BRAILSFORD and A. N. WALKER, University of Nottingham.

GUIDE TO GOOD PROGRAMMING PRACTICE

Edited by B. L. MEEK, Queen Elizabeth College, London and P. HEATH, Plymouth Polytechnic.

CLUSTER ANALYSIS ALGORITHMS: For Data Reduction and Classification of Objects

H. SPÁTH, Professor of Mathematics, Oldenburg University.

DYNAMIC REGRESSION: Theory and Algorithms

L. J. SLATER, Department of Applied Engineering, Cambridge University and

H. M. PESARAN, Trinity College, Cambridge

FOUNDATIONS OF PROGRAMMING WITH PASCAL

LAWRIE MOORE, Birkbeck College, London.

PROGRAMMING LANGUAGE STANDARDISATION

Edited by B. L. MEEK, Queen Elizabeth College, London and I. D. HILL, Clinical Research Centre, Harrow.

THE DARTMOUTH TIME SHARING SYSTEM

G. M. BULL, The Hatfield Polytechnic

RECURSIVE FUNCTIONS IN COMPUTER SCIENCE

R. PETER, formerly Eötvös Loránd University of Budapest.

FUNDAMENTALS OF COMPUTER LOGIC

D. HUTCHISON, University of Strathclyde.

THE MICROCHIP AS AN APPROPRIATE TECHNOLOGY

Dr. A. BURNS, The Computing Laboratory, Bradford University

SYSTEMS ANALYSIS AND DESIGN FOR COMPUTER APPLICATION

D. MILLINGTON, University of Strathclyde.

COMPUTING USING BASIC: An Interactive Approach

TONIA COPE, Oxford University Computing Teaching Centre.

RECURSIVE DESCENT COMPILING

A. J. T. DAVIE and R. MORRISON, University of St. Andrews, Scotland.

PROGRAMMING LANGUAGE TRANSLATION

R. E. BERRY, University of Lancaster

MICROCOMPUTERS IN EDUCATION

Edited by I. C. H. SMITH, Queen Elizabeth College, University of London

STRUCTURED PROGRAMMING WITH COMAL

R. ATHERTON, Bulmershe College of Higher Education

PASCAL IMPLEMENTATION: The P4 Compiler and Compiler and Assembler/Interpreter

S. PEMBERTON and M. DANIELS, Brighton Polytechnic

PRINCIPLES OF TEXT PROCESSING

F. N. TESKEY, University of Manchester

ADA: A PROGRAMMER'S CONVERSION COURSE

M. J. STRATFORD-COLLINS, U.S.A.

REAL TIME LANGUAGES

S. YOUNG, UMIST, Manchester

SOFTWARE ENGINEERING

K. GEWALD, G. HAAKE and W. PFADLER, Siemens AG, Munich



