

Index

Author Index

- Adleman, L., 479, 587
Awerbuch, B., 757
- Barak, B., 481, 775, 781
Beaver, D., 757
Ben-Or, M., 757
Blum, M., 479, 480, 757
- Canetti, R., 753, 757
Chaum, D., 757
Chor, B., 757
Crépeau, C., 757
- Damgård, I., 757
Diffie, W., 475, 478, 587
Dolev, D., 480
Dwork, C., 480, 778, 779
- Even, S., 757
- Feige, U., 782
Feldman, P., 480
- Goldreich, O., 479, 756, 757, 780
Goldwasser, S., 379, 382, 479, 480, 587, 588, 589, 757
- Hellman, M. E., 475, 478, 479, 587
- Impagliazzo, R., 481
- Kilian, J., 778
Krawczyk, H., 780
- Lapidot, D., 782
Lempel, A., 757
Lipton, R., 480
- Merkle, R. C., 479
Micali, S., 379, 382, 479, 480, 587, 588, 589, 756, 757
- Naor, M., 480, 588, 778, 779
- Pfitzmann, B., 589
- Rabin, M., 587, 757
Richardson, R., 778
Rivest, R. L., 478, 587, 588, 589
Rogaway, P., 757
Rompel, J., 588
Rudich, S., 481
- Sahai, A., 480, 778, 779
Shamir, A., 478, 587, 782
Shannon, C. E., 378, 476, 478
- Wigderson, A., 756, 757
- Yao, A. C., 479, 587, 756, 757
Yung, M., 480, 588

Subject Index

- Averaging Argument. *See* Techniques
- Byzantine Agreement, 711
Authenticated, 711–714, 717, 758

- Chinese Remainder Theorem, 421
Claw-free pairs. *See One-way permutations*
Collision-free hashing. *See Hashing*
Collision-resistant hashing. *See Hashing*
 Commitment schemes
 non-oblivious, 771
 perfectly binding, 465–469
 Computational indistinguishability, 382,
 395–402, 446, 447–449, 457, 465,
 467–468, 479, 618, 770
 by circuits, 382–393, 412, 417, 419, 431,
 454, 618
 Cryptographic protocols, 599–764
 active adversary, 603
 adaptive adversary, 603, 748–751
 Authenticated Computation, 664–668,
 671–674, 717–722
 Coin-tossing, 659–664, 674–677, 722–725
 Communication models, 602–603
 Computational limitations, 603
 Concurrent executions, 752–755
 Definitional approach, 601–607
 Definitions, 615–634, 694–700, 742–743,
 749, 752–754
 Environmentally-secure, 753–755
 Fairness, 604, 747–748
 functionality, 599
 General circuit evaluation, 645–648,
 705–707
 honest-but-curious adversary, 603
 Image Transmission, 668–671, 672,
 718–721
 Input-Commitment, 677–680, 725–726
 Multi-party, 599, 600, 604–606, 607–609,
 610–611, 613–615, 693–747, 755
 non-adaptive adversary, 603
 number of dishonest parties, 604
 Oblivious Transfer, 612, 614, 635,
 640–645
 Oracle-aided, 636, 639, 644, 646, 652,
 672, 674, 678, 681, 701, 704, 715,
 718, 721, 722, 726, 729, 737
 Overview, 599–615
 passive adversary, 603
 Privacy reductions, 635–640, 643, 644,
 647, 648, 701–703, 704
 Private Channels, 741–747
 Pure oracle-aided, 721–722
 Reactive, 609, 751–752
 Secret Broadcast, 716–717, 718, 722
 Security reductions, 652–657, 673, 675,
 677, 678, 714–716, 719, 721, 723
 Setup assumptions, 602, 608, 755
 The malicious model, 600, 603, 608,
 610–611, 626, 634, 650–693,
 697–700, 708–741, 746–747
 The semi-honest model, 600, 603, 608,
 610–615, 619, 626, 634–650, 696,
 697, 700–708, 743–746
 Two-party, 599, 600, 606–607, 608,
 611–613, 615–693, 755
 Universally Composable, 753
 Verifiable Secret Sharing. *See Secret*
 Sharing
- Discrete Logarithm Problem. *See DLP*
 function
 DLP function, 584
- Encryption schemes, 373–496
 active attacks, 422–425, 431–474
 asymmetric, 376
 Basic Setting, 374–377
 Block-Ciphers, 408–418, 420
 chosen ciphertext attacks, 423, 438–469,
 472–474
 chosen plaintext attacks, 423, 431–438
 Definitions, 378–403
 indistinguishability of encryptions, 378,
 382–383, 403, 412, 415, 417, 419,
 424, 432, 459, 461, 479
 multiple messages, 378, 389–393,
 394–402, 429, 437–438, 443–449,
 489
 non-malleability, 422, 470–474
 passive attacks, 422, 425–431
 perfect privacy, 378, 476–477
 perfect security, 476–477
 Private-Key, 375–376, 377, 380, 381,
 404–408, 410–413
 Probabilistic Encryption, 404, 410–422
 Public-Key, 376, 377, 380, 381,
 413–422
 Randomized RSA, 416–417, 478
 Semantic Security, 378, 379–382, 478
 Stream-Ciphers, 404–408
 symmetric, 375
 The Blum-Goldwasser, 420–422, 478
 the mechanism, 376–377
 uniform-complexity treatment, 393–403
- Factoring integers, 421, 584
- Hard-core predicates. *See One-way*
 permutations
- Hash and Sign. *See Techniques*

- Hashing
 collision-free, 512–523, 542–543, 558, 560–561, 562, 575
 based on claw-free permutations, 516–519
 via block-chaining, 519–521
 via tree-hashing, 521–523
 collision-resistant. *See* collision-free, 513
 Universal. *See* Hashing functions
 Universal One-Way, 513, 543, 560–575, 588
- Hashing functions, 527–537, 563–565, 596
 AXU, 535–537, 589
 collision probability, 528–531, 535
 generalized, 530–531, 589
- Hybrid Argument. *See* Techniques
- Interactive Proofs
 perfect completeness, 658
 Zero-Knowledge. *See* Zero-Knowledge
- Message authentication, 423, 497–537
 attacks and security, 502–507
 basic mechanism, 501–502
 length-restricted, 507–516
 state-based, 531–537, 548, 585
- NIZK. *See* Zero-Knowledge
- Non-Interactive Zero-Knowledge. *See* Zero-Knowledge
- Non-uniform complexity, 378–393, 402, 618–619, 620, 622
- Oblivious Transfer. *See* Cryptographic protocols
- One-way functions, 423, 525, 538, 539–542, 560–575
 non-uniform hardness, 403, 411
- One-way permutations, 562, 563–565, 570–571
 claw-free collections, 516–519, 542, 588
 collection of, 765–768
 hard-core, 414–422, 431, 640–643
 modular squaring, 419–421
 RSA, 416, 766
 with trapdoor, 403, 413–422, 423, 640–643, 648, 650, 765–768
- Probabilistic encryption. *see* Encryption schemes
- Probability ensembles, 379
 efficiently constructible, 394–403
- Proofs-of-Knowledge, 453, 669–671
 for NP in zero-knowledge, 659, 669, 718–720
- Protocols. *See* Cryptographic protocols
- Pseudorandom functions, 410, 423, 424, 438, 450–452, 523–532, 556–558, 768
 generalized notion, 556, 768
 non-uniform hardness, 411–412
 Verifiable, 590
- Pseudorandom generators, 404
 Computational indistinguishability. *See* Computational indistinguishability
 non-uniform hardness, 392
 on-line, 407–408, 534–537
- Quantum cryptography, 477
- Rabin function, 766
 hard-core, 422
- Random Oracle Methodology, 478, 586–587
- Random Oracle Model. *See* Random Oracle Methodology
- Reducibility Argument. *See* Techniques
- RSA function, 766
 hard-core function, 416
- Secret Sharing, 489, 730–731
 Verifiable, 729–735, 737–740, 752
- Signature schemes, 497–523, 537–598
 attacks and security, 502–507
 authentication-trees, 537, 545–560
 basic mechanism, 501–502, 538
 Fail-stop, 583–584
 incremental signing, 581–583
 length-restricted, 507–516
 memory-dependent, 546–556, 559–560, 588
 off-line/on-line signing, 580–581
 one-time, 465–469, 538–575
 super-security, 465–469, 576–580
 The refreshing paradigm, 537, 543–560
 unique signature, 575–576
- Signatures. *See* Signature schemes
- Simulation paradigm. *See* Techniques
- Synchronous communication, 603, 695, 777
- Techniques
 Averaging Argument, 386
 Hash and Sign, 513–516, 526–537, 542–543, 571–575, 576
 Hybrid Argument, 391, 402, 429, 448–449, 457, 459–461, 467–468, 479, 593, 637–638, 703, 754

INDEX

- Techniques (*cont.*)
Reducibility Argument, 385, 387, 402, 410, 510, 514, 518, 525, 540, 551, 564, 567, 569
the simulation paradigm, 379, 479, 601, 620
- Trapdoor permutations. *See* One-way permutations
- Universal One-Way Hash Functions. *See* Hashing
- Verifiable Secret Sharing. *See* Secret Sharing
- Witness Indistinguishability, 782–783
Non-Interactive, 464–469
Strong, 768–772
- Zero-Knowledge, 775–783
Composition of protocols, 775–780
Concurrent composition, 777–780
for NP, 658, 664–671