

LIST OF TABLES

Number	Page
I. Results of the review of 2004 and 2005 technical papers.	152
II. Reported cost and team size of selected team challenge vehicles.	159
III. Team reference numbers.	421
IV. “Drop dead time”.	423
V. Adopted and derived geometric constants for major coordinate systems.	423
VI. Course length.	423
VII. Average course segment length.	423
VIII. Calculated turn radius and notional diameter using $SSF = 1.02$.	424
IX. Course segment speed.	425
X. Course segments per group.	425
XI. Total distance per group.	426
XII. Reportable change in bearing.	427
XIII. 2004 and 2005 GCE course completion times given notional course-wide speed limits.	428
XIV. Challenge vehicle platform.	429
XV. Team vehicles (2004 QID and GCE participants).	430
XVI. Team vehicles (2005 GCE participants).	431
XVII. Team vehicle closest match (2004 QID and GCE participants).	432
XVIII. Team vehicle closest match (2005 GCE participants).	434
XIX. Typical values for the kinetic coefficient of friction.	436
XX. Turning circle for selected challenge vehicles.	437
XXI. Calculated rollover speed for selected challenge vehicles.	440
XXII. 2004 GCE standard questions.	441
XXIII. 2005 GCE standard questions.	445
XXIV. State sensors in use by 2004 QID and GCE participants.	447
XXV. Environment sensors in use by 2004 QID and GCE participants.	452
XXVI. Navigation sensors in use by 2004 QID and GCE participants.	457
XXVII. Environment sensors in use by 2005 GCE participants.	462
XXVIII. Navigation sensors in use by 2005 GCE participants.	465
XXIX. Known sensors by quantity (2004 QID and GCE participants).	469
XXX. Known sensors by manufacturer (2004 QID and GCE participants).	470
XXXI. Known sensors by manufacturer and model number (2004 QID and GCE participants).	471
XXXII. Known sensors by quantity (2005 GCE participants).	472
XXXIII. Known sensors by manufacturer (2005 GCE participants).	473
XXXIV. Known sensors by manufacturer and model number (2005 GCE participants).	474
XXXV. Alphabetical list of acronyms in use throughout this technical report.	475
XXXVI. Major obstacle and path detection sensors by type (2004 QID and GCE participants).	476

XXXVII. Major obstacle and path detection sensors by type (2005 GCE participants).	478
XXXVIII. High-quality obstacle and path detection sensors (2004 QID and GCE participants).	480
XXXIX. High-quality obstacle and path detection sensors (2005 GCE participants).	481
XL. Number of teams using high-quality sensors.	482
XLI. Number of high-quality sensors in use.	482
XLII. Number of high-quality sensors in use by teams which participated in both the 2004 and 2005 GCE.	483
XLIII. Number of SICK LMS LIDAR sensors in use by teams which participated in the 2004 and 2005 GCE.	483
XLIV. Navigation sensor integration (2004 QID and GCE participants).	484
XLV. Navigation sensor integration (2005 GCE participants).	485
XLVI. Navigation sensor integration strategies and Kalman filter usage by teams which participated in both the 2004 and 2005 GCE.	486
XLVII. Navigation sensor integration strategies in use by teams which participated in the 2004 or 2005 GCE.	487
XLVIII. Kalman filter usage by teams which participated in the 2004 or 2005 GCE.	487
XLIX. COTS integration using a Kalman filter by teams which participated in the 2004 or 2005 GCE.	487
L. Navigation sensor integration strategies in use by teams which participated in both the 2004 and 2005 GCE.	488
LI. Kalman filter usage by teams which participated in both the 2004 and 2005 GCE.	488
LII. COTS integration using a Kalman filter by teams which participated in both the 2004 and 2005 GCE.	488
LIII. Stopping distance for selected values of v and μ_k .	489
LIV. Maximum distance between the path of travel in a constant-radius turn and the left- or right-limit of field-of-view of various RADAR systems.	490
LV. Comparison of stopping distance to maximum obstacle detection range for VISION, STEREO, LIDAR, and RADAR sensors (2004 QID and GCE participants).	491
LVI. Comparison of stopping distance to maximum effective range for VISION, STEREO, LIDAR, and RADAR sensors (2004 QID and GCE participants).	495
LVII. Field-of-view limitations for VISION, STEREO, LIDAR, and RADAR sensors (2004 QID and GCE participants).	499
LVIII. Comparison of stopping distance to maximum obstacle detection range for VISION, STEREO, LIDAR, and RADAR sensors (2005 GCE participants).	503
LIX. Comparison of stopping distance to maximum effective range for VISION, STEREO, LIDAR, and RADAR sensors (2005 GCE participants).	506
LX. Field-of-view limitations for VISION, STEREO, LIDAR, and RADAR sensors (2005 GCE participants).	509

LXI. Number of sensors for which stopping distance exceeded maximum obstacle detection range.	513
LXII. Number of sensors for which stopping distance exceeded maximum effective range.	513
LXIII. Number of teams for which stopping distance exceeded the maximum obstacle detection range of sensors in use.	514
LXIV. Number of teams for which stopping distance exceeded the maximum effective range of sensors in use.	514
LXV. Average ratio of stopping distance to range for sensors in use by teams which participated in both the 2004 and 2005 GCE.	515
LXVI. Primary group identity and sponsorship of teams participating in the 2004 QID and GCE.	516
LXVII. Primary group identity and sponsorship of teams participating in the 2005 GCE.	517
LXVIII. Sponsorship of teams which participated in both the 2004 and 2005 GCE.	518
LXIX. Number of preventable failures reported by teams participating in the 2005 GCE.	519
LXX. Reported ranges of 2004 challenge vehicles.	520
LXXI. Electrical power generation strategies for teams which participated in the 2004 GCE.	522
LXXII. Electrical power generation strategies for teams which participated in the 2005 GCE.	524
LXXIII. Manufacturer index.	527