

Patent Selections:

The patents annotated in this section have been selected from various patent databases. These recent patents are relevant to the articles published in this journal issue, categorized by different analytical methods, designs, manufacturing and analysis of automobiles, aircrafts, manufacturing plants, industrial instruments, machines, heating and cooling systems and processes involved and related to mechanical engineering.

BIONIC PRINCIPLE & DRIVE TYPE

1. Karunasiri, T.R. Systems for detecting a compliance state of a current source included in a cochlear implant. *EP3110500 (2018)*.
2. Gill, H. Systems and methods for prosthetic wrist rotation. *US20180064563 (2018)*.
3. Amundson, K. Exoskeleton and method of transferring a weight of a load from the exoskeleton to a support surface. *US20180042803 (2018)*.
4. Hepler, D.L., Mullins, C.E. Dead-reckoning drift compensation using personal gait. *WO2018018133 (2018)*.

HAND FUNCTION REHABILITATION ROBOT & HAND REHABILITATION TRAINING

1. Kwon, S.C., Min, D.M., Kim, Y.H. Gait rehabilitation control system and method therefor. *EP3287983 (2018)*.
2. Hyung Jung, J., Rodríguez De, P.C., Belloso Linacisoro, A., Valencia Blanco, D., Keller, T. Portable device for upper limb rehabilitation. *EP3263087 (2018)*.
3. Farlow, T.S., Rosenstein, M.T., Halloran, M., Won, C., Shamlian, S.V., Chiappetta, M. Mobile robot system. *US9902069 (2018)*.

MOTOR & PNEUMATIC ARTIFICIAL MUSCLE

1. Forsell, P. Implantable medical device for lubricating an artificial contacting surface. *US20180028320 (2018)*.
2. Bulea, T.C., Lerner, Z.F., Damiano, D.L., Gravunder, A. Powered gait assistance systems. *WO2018023109 (2018)*.

PNEUMATIC CYLINDER & SHAPE MEMORY ALLOY

1. Kocurek, C., Song, G., McWhorter, D. Shape memory alloy powered hydraulic accumulator. *US9874064 (2018)*.
2. Perner, N., Bronowski, H. Actuator assembly comprising shape memory adjusters, and operating method. *WO2018010711 (2018)*.
3. Knieling, E. Device for cleaning and sterilizing a filling valve of a beverage filling system for filling a container with a filling product. *US20180000975 (2018)*.
4. Steiner, B., Lorenz, T., Mehning, J. Internal combustion engine with a lubrication system and method for producing an internal combustion engine. *US9822678 (2018)*.

CENTRAL PATTERN GENERATOR & GAIT CONTROL & GAIT PLANNING

1. Herr, H.M., Weber, J.A., Casler, R.J. Biomimetic joint actuators. *US9872782 (2018)*.
2. Omarsson, B., Kristinsdottir, H., Boon, L., Jansen, M. Orthopedic device for treating drop foot and method for using the same. *US20180042752 (2018)*.

HYDRAULIC QUADRUPED ROBOT & INTELLIGENT CONTROL

1. Jackowski, Z.J., Berard, S., Khripin, A., Rizzi, A.A. Robotic hydraulic system. *US9879700 (2018)*.
2. Stoia, L., Latimer, C., Guilbert, M. Methods and systems for adjusting operation of a robotic device based on detected sounds. *US20180029236 (2018)*.
3. Thorne, C.E., Saunders, J.A., Da Silva, M., Miller, T.H., Perkins, A.D. Three-piston ankle mechanism of a legged robot and associated control system. *US9878751 (2018)*.

SPRING-LOADED INVERTED PENDULUM & VIRTUAL LEG

1. Glöckl, J., Schröder, T.H. Active dynamic chair. *US9867472 (2018)*.
2. Bewley, T.R., Schmidt-Wetekam, C.M., Morozovsky, N., Grinberg, M. Multimodal dynamic robotic systems. *US9902058 (2018)*.
3. Von Zitzewitz, J., Mignardot, J.B., Le Goff, C.G.M., Courtine, G., Vallery, H. Apparatus comprising a support system for a user and its operation in a gravity-assist mode. *WO2018033591 (2018)*.

GAIT CONTROL & GAIT PLANNING & HYDRAULIC QUADRUPED ROBOT

1. Whitman, E. Methods and systems for planning a body position of a robotic device. *US9868210 (2018)*.

GAIT CONTROL & HYDRAULIC QUADRUPED ROBOT

1. Da Silva, M., Blankespoor, K., Nelson, G. Ground plane compensation for legged robots. *US9908240 (2018)*.

VIBRATION ENERGY RECOVERY DEVICES

1. Cerniway, M., Maples, M., Mellier, G. Apparatus and method for vibration mitigation with dynamic vibration absorber. *US20180051770 (2018)*.

2. Deenoo, Y., Tan, P.H., Pelletier, G. Connectivity supervision and recovery. *WO2018031799 (2018)*.

VIBRATION ENERGY RECOVERY DEVICE & ENERGY CONSUMPTION

1. Kosar, A. An energy harvesting device. *WO2018030967 (2018)*.
2. Boyd, C.D., Face, B.R., Shepard, J.D. Devices and systems incorporating energy harvesting components/devices as autonomous energy sources and as energy supplementation, and methods for producing devices and systems incorporating energy harvesting components/devices. *US20180012931 (2018)*.
3. Vogel, R., Greenberg, A., Paulson, D. Methods and apparatuses for reducing membrane fouling, scaling, and concentration polarization using ultrasound wave energy (USWE). *US20180056244 (2018)*.
4. Boyd, C.D. Integrated circuit components incorporating energy harvesting components/devices, and methods for fabrication, manufacture and production of integrated circuit components incorporating energy harvesting components/devices. *US20180026075 (2018)*.
5. Beijing Samevolt Co., Ltd. Smart battery, electric energy allocation bus system, battery charging and discharging method, and electric energy allocation method. *EP3264560 (2018)*.

VIBRATION ENERGY RECOVERY DEVICE & PIEZOELECTRIC EFFECT

1. Kubota, M., Murakami, S., Watanabe, T., Ueda, M. Piezoelectric material, piezoelectric device, and electronic apparatus. *US9893267 (2018)*.
2. Yeoh, I.L., Reinhall, P.G., Seibel, E.J., Kundrat, M.J. Adaptive control of a fiber scanner with piezoelectric sensing. *US9872606 (2018)*.
3. Dufay, T., Ginestar, S., Seveno, R., Guiffard, B. Method for chemically obtaining a flexible piezoelectric structure. *EP3232484 (2018)*.

COAL AUGER MINING

1. Grande, S.F., Draper, D.R., Suheil, S. System and method for a multiphase hydrocarbon pump having an auger coupling. *US20180003022 (2018)*.
2. Greulich, C.R., McDonald, K., Cheng, W. Method for improving overflow clarity in production of coal. *US20180016166 (2018)*.
3. Demirel, H. Low emission hybrid incinerator for turbulent combustion of solid and biomass fuel. *WO2018004483 (2018)*.

PNEUMATIC CONVEYING & COAL AUGER MINING

1. Oren, J., Oren, J. Methods and systems to transfer proppant for fracking with reduced risk of production and release of silica dust at a well site. *US9862551 (2018)*.

2. Zank, J., Rayson, M.S., Sujansky, V., Walter, J., Kirby, I.J., Cooper, J. Explosive composition manufacturing and delivery platform, and blasting method. *US9879965 (2018)*.
3. Oren, J., Boros, M., Berveiler, P., Hansen, D., Campbell, C., Edwards, M., Massalone, T. Conveyor with integrated dust collector system. *US9868598 (2018)*.
4. Hoag, G.E., Collins, J.B., Anderson, D. Method for extraction and surfactant enhanced subsurface contaminant recovery. *US9895730 (2018)*.

PNEUMATIC FILLING & THIN SEAM MINING

1. Michiwaki, H. Conduction-path-equipped member, method for patterning conduction path, and method for measuring changes in member. *EP3279628 (2018)*.
2. Hyland, G.E., Keefe, R.P., Zakas, M.E., Barker, C.R. Infrastructure monitoring devices, systems, and methods. *US9861848 (2018)*.
3. Lin, H.H., Hsu, Y.Y. Internal tensioning structure useable with inflatable devices. *US9901186 (2018)*.

GANGUE FILLING

1. Zhang, Q., Zhang, J., Yan, H., Tai, Y., Qiao, M. Method for modifying filling material mechanical characteristic curve based on actual measurements. *WO2018014477 (2018)*.
2. Tomlinson, M., Martinez, T., Hille, S. Process for separation of at least one metal sulfide from a mixed sulfide ore or concentrate. *US9885095 (2018)*.
3. Xia, Z. Multistage roasting-smelting method and equipment for reduction iron making. *WO2018014148 (2018)*.

DESIGN REQUIREMENTS & INDEPENDENT NURSING ROBOT

1. O'brien, K.P., Gandhi, J. Mobile robot system. *US9908239 (2018)*.
2. Angle, C., Vu, C., Cross, M., Campbell, T.L. Displaying images from a robot. *US9878445 (2018)*.
3. Crinklaw, D.C., Schapansky, C., Vaccari, R., Bischel, J., Johnson, R. Robotic agricultural system and method. *US9877470 (2018)*.
4. Baym, M.H., Bangera, M.G., Chin, H.W., Hyde, R.A., Kare, J.T., Myhrvold, N.P., Sweeney, E.A. Robotic debridement apparatuses, and related systems and methods. *US20180000502 (2018)*.
5. Giordano, J.R., Swayze, J.S., Shelton, F.E. Surgical instrument with wireless communication between a control unit of a robotic system and remote sensor. *US20180000545 (2018)*.

NURSING ROBOT & NURSING BED & REHABILITATION

1. Fauquex, A., Charroton, Y. Motorized exercise device and methods of exercise learning. *US20180049937 (2018)*.

2. Macoviak, J.A., Macoviak, R.L., Macoviak, J.J., Kahatt, E.G. Remotely-executed medical therapy device. *US9907730 (2018)*.
3. Tran, B. Mesh network personal emergency response appliance. *US9901252 (2018)*.
4. Horseman, S.J., Gonter, C. Systems, protective casings for smartphones, and associated methods to enhance use of an Automated External Defibrillator (AED) device. *US9889311 (2018)*.
5. Ghovanloo, M., Block, J. Wireless real-time tongue tracking for speech impairment diagnosis, speech therapy with audiovisual biofeedback, and silent speech interfaces. *US9911358 (2018)*.

NURSING ROBOT & MULTI-FUNCTIONAL & REHABILITATION

1. Christensen, S.S., Lucero, A.D., Riley, B., Lafay, E.B., Scott, D.D. Mobile patient bed. *US9901503 (2018)*.

NURSING ROBOT & REHABILITATION

1. Bonutti, P.M. Methods for robotic surgery using a cannula. *US20180036015 (2018)*.
2. Firminger, S.P., Garms, J., Hyde, R.A., Jung, E.K.Y., Karkanias, C.D., Leuthardt, E.C., Levien, R.A., Richard, L.T., Robert, L.W., Malamud, M.A., Rinaldo Jr., J.D., Tegreene, C.T., Tolle, K.M., Wood Jr., L.L. Computational systems and methods for health services planning and matching. *US9911165 (2018)*.

BRAKE FRICTION PAIR & FATIGUE LIFE

1. Suzuki, M., Chelaidite, G., Al-Mahshi, W. Linear motion mechanism. *EP3263415 (2018)*.
2. Schultheis, O.J., Gordon, T.E., Birler, M.J., Kline, P.M. Rocker assembly having improved durability. *US9874122 (2018)*.

LIFE PREDICTION & NEURAL NETWORK

1. Birdwell, J.D., Dean, M.E., Drouhard, M.G., Schuman, C.D. Method and apparatus for constructing a neuroscience-inspired artificial neural network with visualization of neural pathways. *US20180018358 (2018)*.
2. Commons, M. Intelligent control with hierarchical stacked neural networks. *US9875440 (2018)*.
3. Ning, G., Wang, H., Ren, X. Method and system for optimized wake-up strategy via sleeping stage prediction with recurrent neural networks. *US20180060507 (2018)*.
4. Song, D., Chen, H., Jiang, G., Qin, Y. Video system using dual stage attention based recurrent neural network for future event prediction. *US20180060666 (2018)*.
5. Ahmed, M.N., Baughman, A.K., Behnken, J.F., Marzorati, M. Forecasting and classifying cyber-attacks using neural embeddings based on pattern of life data. *US20180077191 (2018)*.

PHYSICAL MODEL & STATISTICAL ANALYSIS & WEAR LIFE

1. Martineau, J., Schwaderer, W.D., Choi, C. Enhanced multi-streaming though statistical analysis. *US9898202 (2018)*.
2. Muthuvaradharajan, C. System and method for dynamically determining balance shelf life of an industrial component. *US20180033134 (2018)*.
3. Jain, C., Ward, M.R. Managing asset placement using a set of wear leveling data. *US9886324 (2018)*.
4. Dashevskiy, D., Macpherson, J.D. Life-time management of downhole tools and components. *US9857271 (2018)*.

CONTROL STRATEGY & EMBEDDED CONTROL SYSTEM & HYDRAULIC TEST PLATFORM

1. Crowe, D., Crom, E. Pump-engine controller. *US9869305 (2018)*.
2. Smith, B.C., Mackenzie, D., Lu, Y., Potrebic, P., Jourda, F., Parmar, K. Maintaining and updating file system shadows on a local device by a synchronization client of a cloud-based platform. *US9805050 (2018)*.
3. Crowe, D., Crom, E. Multi-compatible digital engine controller. *US9879609 (2018)*.
4. Odhner, L., Jentoft, L., Tenzer, Y., Keck, M., Howe, R. Training robotic manipulators. *WO2018017612 (2018)*.
5. Lokey, R.F. Solar tracker system for large utility scale solar capacity. *US20180054156 (2018)*.

RAPID CONTROL PROTOTYPE & SHOCK ABSORBER

1. Wilhelm, E. Vehicles, vehicle controller systems, methods for controlling a vehicle, and methods for controlling a plurality of vehicles. *US20180010915 (2018)*.
2. Shannahan, M.S., Ray, P.S. Mechanical shock resistant motorized drive assembly. *US20180010728 (2018)*.
3. Konishi, T., Hiraoka, T., Yamaki, K., Kameda, N. Method for recovering pulp fibers from used absorbent article. *WO2018025499 (2018)*.

THREE VARIABLE CONTROLLER & DIGITAL SIGNAL PROCESSOR (DSP)

1. Lee, W.C., Song, J.H., Choi, Y.S. DSP interface apparatus and control method for the same. *US20180054383 (2018)*.
2. Miller, J.A. Musical instrument effects processor. *US9812106 (2018)*.

MECHANICAL SEAL WITH DIMPLES & VARYING DIMPLE DEPTH

1. Lim, D.-S., Lee, E.-S., Kim, T.H., Lee, C.H., Lim, Young, K. Method for producing carbide derived carbon layer with dimple pattern and carbide derived carbon

layer with dimple pattern produced by the method. **US20180016194 (2018).**

2. Luciano, R.A., White, W., Grieshaber, D. Golf ball with encapsulated RFID tag. **US20180015331 (2018).**
3. Yue, M., Liu, D.M., Roy, J., Chiang, Y.-M., Yang, J.M., Lehto, D., Vann, C.S., Beard, N.P., Harding, I.A., Van Camp, J.R., Dromaretsky, A., Ermakov, S.V., Oldham, M.F., Shariati, M., Ulmanella, U. Systems and methods for multiple analyte detection. **US20180016624 (2018).**

CFD METHOD & SEALING PERFORMANCE

1. Di Mare, L., Kulkarni, D.Y. Computer implemented methods, apparatus, computer programs and non-transitory computer readable storage mediums for automatically designing a secondary air system for a gas turbine engine. **US20180046749 (2018).**

2. Henri, J., Hausmann, D.M., Van Schravendijk, B.J., Tang, S., Leeser, K.F. Selective inhibition in atomic layer deposition of silicon-containing films. **US9875891 (2018).**
3. Adams, D. Anti-swirl device. **US9874220 (2018).**

OPENING FORCE & LEAKAGE RATE

1. Shim, J.H., Kim, C.H. Method of eliminating leakage from fuel tank valve. **US20180034085 (2018).**
2. Wolff, H., Blattert, D., Mannherz, E. Method for determining a leakage in a hydraulic brake system. **US20180050678 (2018).**
3. Henderson, C.E., Shelton, F.E., Harris, J.L., Yates, D.C., Widenhouse, T.S. Control of advancement rate and application force based on measured forces. **US20180049822 (2018).**